The Journal of the American Medical Association

Published Under the Auspices of the Board of Trustees

VOL. LXVI, NO. 9 CHICAGO, ILLINOIS FEBRUARY 26, 1916

PRESENT VIEWS IN RESPECT TO MODES AND PERIODS OF INFECTION IN TUBERCULOSIS *

MAZŸCK P. RAVENEL, M.D.

Professor of Preventive Medicine and Bacteriology, and Director of Public Health Laboratory, University of Missouri, School of Medicine

COLUMBIA, MO.

In considering the various modes in which infection with the tubercle bacillus can occur, we may, for the purposes of this paper, leave out of discussion all except inhalation and ingestion. There is practically no difference of opinion concerning their relative importance. They play small part in the epidemiology of the disease, and the total number of cases due to them is insignificant compared to those in which infection takes place through the respiratory and the digestive tracts. Both routes of infection are universally recognized, and there remains to be determined now only their relative importance as portals of entry.

Tuberculosis is a disease, the lesions of which are found so preeminently in the lung that it is easy to understand how the older physicians considered the respiratory tract the route of invasion. The classic work of Arnold gave scientific standing to this idea, since it proved that the lung could be invaded even by particles of inert matter, such as lampblack, introduced by the respiratory tract, and the experiment of Cornet, who exposed guinea-pigs to the dust produced by breaking up dried tuberculous sputum with a broom, resulting in the infection of most of the animals, seemed to settle the question in favor of this method from a practical point of view.

The older observations were apparently lost sight of, and did not receive due consideration until after the memorable British Congress on Tuberculosis in 1901, when the attitude of Koch in regard to the danger of bovine tuberculosis and the alleged rarity of primary intestinal tuberculosis brought them to the front once more.

RESPIRATORY INFECTION

The work of Arnold and the experiments of Cornet have been mentioned as furnishing the basis for the belief that tuberculous infection took place mainly through the respiratory tract. Further evidence seemed to be at hand in the greater number of cases in which the supposedly primary lesion was found in the lung and bronchial lymph nodes as compared with the intestine and mesenteric glands. The value of this evidence has been weakened during recent years by the discovery of the fact that, in children particularly, the bronchial lymph nodes are often tuberculous when no change can be found in the lung; and the belief is growing that the bronchial glands and small lymph nodes are first infected, and the lung tissue becomes involved later. Schroeder and Cotton have demonstrated that infection of the lung and bronchial glands can result from inoculation into the most distant parts of the body. A calf inoculated under the skin at the end of the tail died affected with tuberculosis of the lungs. The bronchial mediastinal and mesenteric glands were edematous and contained tubercle bacilli, though not having the histologic changes of tuberculosis.

Three hogs inoculated in the same way developed progressive tuberculosis of the lungs, liver and inguinal glands, and in one the gastrohepatic and bronchial glands were involved.

It is evident that infection of the lung is not the simple process of inhaling bacilli directly into the alveoli, as was formerly believed, but involves a more complicated mechanism.

The fixing of the portal of entry by the so-called oldest lesion is also open to serious question. I have produced fatal pulmonary tuberculosis in monkeys by feeding, with very insignificant intestinal lesions. All the oldest lesions were located in the lungs and bronchial glands, yet the method of feeding largely precluded the possibility of the tubercle bacilli reaching the lung except through the digestive tract. Practically all observers agree that in children there is a marked tendency to rapid and general dissemination of the disease, and many note that it is frequently impossible to determine the oldest lesion. As our conclusions have been drawn largely from postmortem observations on children, these facts are significant.

Dust and Spray.—In regard to the form in which tubercle bacilli are inhaled, all are agreed that dust from dried and pulverized sputum, and mouth spray produced in coughing, talking, sneezing, etc., both play their part. The relative danger of the two methods has not been determined, some believing that dust is the chief menace, while others follow Flügge in holding that the mouth spray produces infection more readily. The bacilli in the spray are certainly more apt to be alive and virulent. Both must be recognized as capable of producing infection, and droplet infection is probably the more dangerous.

INFECTION THROUGH THE DIGESTIVE TRACT

The first recorded cases of infection through the digestive tract are those of Klenke, who in 1846 gave the histories of sixteen children who had been fed on cow's milk, and all of whom showed tuberculosis of the intestines, glands, skin or bones.

* Read before the Section on Public Health and Medical Science, Second Pan-American Scientific Congress, Washington, D. C., Dec. 28, 1915.

Previous to this, however, Carmichael, in 1810, recorded as his observation that he had frequently seen the mesenteric glands strumous without involvement of the external glands, and this led him to believe that in scrofula the mesenteric glands were first involved. He referred to the frequency of a disease similar to scrofula seen in pigs fed on sour milk, and called attention to the common occurrence of bowel trouble in children at the time of weaning "too often followed by disease of mesenteric and lymphatic glands."

Casper, in 1882, referred to the extent of tuberculosis ("nodular consumption") among the milch cows of Paris, and said, "It is possible that there is a connection between this phenomenon and the many tuberculous diseases among the children of Paris."

Experimental evidence of tuberculous infection in cattle by feeding was given as early as 1868, by Chauveau, who extended his work with corroborative results in 1872 and 1873; and Villemin in 1869 obtained positive results by feeding in rabbits and guinea-pigs. He was the first to employ a tube for the introduction of tuberculous material into the stomach. Experiments by scientists of every nation have given positive support to the work of these early observers. It is also a well-known and widely observed fact that in the spread of tuberculosis of cattle and swine the digestive tract plays a most important rôle. Swine particularly are infected through the digestive tract in the great majority of cases, and the ingestion of milk from tuberculous cattle is universally recognized as one of the chief factors in the spread of the disease among these animals. The first examination made by the officers of the federal Meat Inspection Service is based on this fact. In 93.3 per cent. of cases, tuberculous hogs show infection of the cervical glands.

> "As the disease is essentially produced by ingestion, the glands and tissues associated with the digestive tract are the most frequent seats of infection. Indeed, the superior cervical glands (in almost all cases the submaxillary gland) are nearly always affected, as at the postmortem examination held by bureau inspectors over a consecutive period on 120,000 tuberculous hog carcasses, 93.3 per cent. were found to contain lesions in these glands. The large tonsils and the large number of lymph sinuses in the lymph glands probably account for this great frequency."
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> "From some records relative to the locations of tuberculous lesions in cattle that were made at the same time that the figures pertaining to hogs were collected, it appears that in tuberculous cattle the lesions of tuberculosis were located in the cervical glands in 66⅔ per cent. of the animals, in the bronchial glands in 54.5 per cent., and in the mediastinal glands in 63.6 per cent."

In 1901, in his London address, while discussing the relation of bovine tuberculosis to human health, Koch took the ground that infection through food could be assumed to have taken place with certainty only when the primary tuberculous lesion was located in the intestines. He asserted that this was rarely found to be the case, and argued that the danger of infection through food was slight. The stand taken by Koch assumed that the tubercle bacillus was unable to gain entrance to the system through the intestinal wall without the production of a lesion at the point of entrance.

The question raised by Koch has been thoroughly investigated, and it can be said with certainty that the tubercle bacillus can penetrate the mucous membrane of the upper digestive tract as well as that of the intestine readily and quickly, without producing a tuberculous lesion at the point of entry. By Baumgarten, however, it is held that there is always a focus of infection at the point of entrance sooner or later, even though it may be microscopic. Against this is the demonstration by von Behring and Roemer of the ready permeability of the intestinal mucosa of young animals by various bacteria — even the large anthrax bacillus. In 1,000 swine, infected through food, Ostertag found the glands of the throat, neck and mesentery tuberculous, while the mucous membrane of the intestine was always free from disease. Orth, in 1879, and Cornet, in 1880, observed bacilli pass step by step through the fully developed mucous membrane of the uninjured intestine and reach the lymph channels and mesenteric glands, leaving no recognizable trace behind (Furst). Dobroklonski, in 1890, working under Cornil, showed that the tubercle bacillus would quickly penetrate the healthy wall of the intestine in guinea-pigs. Desoubry and Porcher, students of Nocard, showed in dogs that during the digestion of fats large numbers of bacteria were carried through the intestinal wall and could be detected in the chyle within a few hours after the meal was given. If food free from fat was given, few or even no bacteria could be found. Nicolas and Descos, in 1902, found that tubercle bacilli given to dogs in fatty food reached the chyle within three hours. During feeding experiments conducted at the laboratory of the State Live Stock Sanitary Board of Pennsylvania, we frequently observed extensive tuberculosis of the lungs and thoracic glands in animals which showed slight or even no involvement of the intestine. In 1902-1903, I introduced into the stomachs of a number of dogs tubercle bacilli suspended in an emulsion of melted butter and warm water, using a tube in order to prevent possible infection through the trachea. The dogs were killed after three and one-half to four hours, during active digestion, as much chyle as possible was collected, and the mesenteric glands were removed. Guinea-pigs were inoculated with this material. Tubercle bacilli were demonstrated in abundance in eight of ten experiments. The dogs were kept on soft food for some days before the experiments, and were purged with castor oil, in order to rid the intestine of all foreign matter which might injure the mucous membrane. Numerous sections of the intestine were examined also, but no injury could be detected.

It is possible here only to mention the work of Calmette and his students, as a result of which he concluded that pulmonary tuberculosis acquired at any age may be due to recent intestinal infection.

The rapidity with which tubercle bacilli penetrate the intestine and reach the lung through the thoracic duct is remarkable. Besanti and Panisset found that when fed to dogs in soup they reached the heart blood within from four to five hours. Bartel found that after a single dose they penetrated the uninjured intestine and reached the mesenteric glands during the following digestive period. Schlossmann and Engel, by inoculating tubercle bacilli suspended in cream into the stomachs of young guinea-pigs through an incision in the abdominal wall, demonstrated that they reached the lung within six hours. Their work has been confirmed by Ravenel and Reichel. Rabinowitsch and Oberwarth established nutrition through a gastric fistula in swine, and then resected the esophagus, after which tubercle bacilli were introduced into the stomach. Within twenty-four hours they were shown to have penetrated to many organs of the body.

INFECTION BY THE BOVINE TUBERCLE BACILLUS

The statement of Koch in 1901 that bovine tuberculosis was not a menace to public health has also led to a vast amount of study which throws light on the portal of entry of the tubercle bacillus. It is conceded by every one that bovine tuberculosis is found almost exclusively in children under the age of 16 years, and that the susceptibility to this type of infection is greater during the first five years of life than it is afterward. It is perfectly evident that the only exposure that children of this age can have to the bovine germ is through the food which they eat, and infection is, therefore, invariably through the digestive tract.

The results of the English royal commission, the German imperial commission, and numerous private workers have been frequently quoted, and I give in Table 1 a summary of instances collected by Dr. Park which indicates fairly the amount of infection due to the bovine tubercle bacillus, especially in fatal cases.

Many nonfatal cases of tuberculosis are also caused by the bovine germ. These are found almost exclusively in children, and the infection is through the digestive tract.

Fraser, in sixty-seven cases of bone and joint tuberculosis in children under 12 years of age, found the bovine germ forty-one times, the human twenty-six times, and both three times.

TABLE 1.—INFECTION DUE TO THE BOVINE TUBERCLE BACILLUS IN INSTANCES COLLECTED BY PARK

Persons Age	Cases		
	Total Number	Human	Bovine
Adults, 16 years and over	955	940	15
Children, from 5 to 16 years	177	131	46
Children, from 0 to 5 years	368	292	76

Mitchell examined seventy-two children under 12 years of age with cervical adenitis, and found the bovine germ in sixty-five, the human in only seven.

It should be remembered that the human tubercle bacillus is capable also of producing infection through the digestive tract, and the mistake must not be made of considering only those cases in which the bovine germ is found as due to ingestion.

INFECTION THROUGH THE TONSILS

The frequency of infection through the tonsils has been recently called in question by von Pirquet, who quotes Albrechts and Ghon to support his view. The former in 1,060 cases found only three instances of primary tonsillar infection, and the latter in 189 cases found only one. It is hard to reconcile these findings with those of others, or with experimental work.

Wood has collected from the literature 1,671 instances, eighty-eight (5.2 per cent.) of which showed primary tuberculosis. These examinations were made by various methods, and probably fall short of the truth. Lartigau and Goodale have shown that systematic inoculation of animals gives a higher percentage of tuberculosis. In seventy-five cases, Lartigau found twelve (or 16 per cent.) tuberculous. Dieulafoy, by the inoculation of guinea-pigs, found tuberculosis of the tonsils in fifteen of ninety-six cases. This work has been criticized on the ground that no histologic examinations were made, as Dieulafoy was not careful to exclude the crypts, which may lodge tubercle bacilli. Latham, however, who avoided these sources of error, in twenty-five consecutive necropsies on children from 3 months to 13 years of age, found seven which were tuberculous—results practically identical with those of Dieulafoy. Confirmatory reports have been made by a large number of observers, many of which are included in the figures quoted from Wood. The susceptibility of the tonsils to tuberculous infection is shown by the examination of persons dead of phthisis.

Experimentally, the tonsils are readily infected, by direct application, as well as by feeding tuberculous material. In a series of experiments which I carried out at the laboratory of the State Live Stock Sanitary Board of Pennsylvania, swine fed with tubercle bacilli from man and from cattle developed generalized tuberculosis, with marked involvement of the tonsils, apparently primary, with necrosis and ulceration.

The experiments on these lines are too numerous to review here. Practically all experimental observers have noted the susceptibility of the tonsils to tuberculous infection. Wood of Philadelphia has carried out a most instructive series of experiments on swine. He found that the application of tubercle bacilli to the back of the mouth rapidly produced primary tuberculosis of the tonsils, soon followed by involvement of the submaxillary and cervical glands and extensive disease of the lungs. The mesenteric and bronchial glands were always diseased in about an equal degree.

I have referred above to experiments carried out on monkeys by feeding, in which the lungs showed extensive and destructive tuberculosis. In these animals, while no lesion of the tonsil could be found, caseous lymphatic glands were found in the neck in the region draining from the throat, and there could be no doubt that a part of the infection at least occurred by penetration of the mucous membrane in this region.

Grober believes that infection through the tonsil is the most frequent origin of apical tuberculosis. His experiments have demonstrated that from the cervical glands there is a direct route to the pleurae and lungs, and that this leads especially to that portion of the lung most frequently the primary seat of tuberculosis—the apex.

The evidence that the tonsils are frequently the portal of entry for the tubercle bacillus appears to me very conclusive, and it seems equally certain that food is the bearer of the infection in a large proportion of cases.

PERIOD OF INFECTION IN TUBERCULOSIS

Few problems offer more inherent difficulties in their solution than the determination of the age at which tuberculous infection occurs. It is easy to construct tables showing the age at which the disease becomes manifest clinically, but, except in the early years of life, these give little clue to the exact time of infection.

There is no doubt of the existence of a widespread opinion that infection takes place chiefly in infancy and childhood, and this opinion appears to be growing. It seems to have a legitimate basis, even if not wholly true. In 1900, Naegeli showed by necropsies in Zurich that by the age of 30, 99 per cent. of persons showed tuberculous lesions or scars, results which have been in a measure confirmed in other cities, but which cannot be accepted as correct for the general population.

The use of tuberculin by the method of von Pirquet, or some of its modifications, is even more directly responsible for the belief in early infection. Von Pirquet himself obtained positive reactions among

children of the poorer class in Vienna in a surprising number of cases—70 per cent., if clinical cases of tuberculosis are excluded, and 80 per cent. if included, as shown by Table 2.

More surprising even are the results of Hamburger and Monti, also on children of the poorer class in Vienna (Table 3).

Based on such findings, the belief is widely held that over 90 per cent. of children are infected with tuberculosis by the 14th year, and statements have been made that tuberculosis in adult life is only the recrudescence of infection acquired in early life.

A further study of reports from different parts of the world reveals marked variations in the percentage of positive reactions, but all show that tuberculous infection in childhood is extremely common, as seen by Table 4.

Postmortem reports by von Pirquet, Müller and others show that the positive reactions fall short of showing the full number of those infected.

Turning to recent work in the United States, we find a somewhat different picture. Veeder and Johnston tested 1,321 hospital children in St. Louis, and obtained a maximum of 48 per cent. positive reactions at the age period from 10 to 14, including cases of clinical tuberculosis, and 38 per cent. exclusive of these.

Cattermole of Colorado, in a series of sixty-six cases from 1 to 14 years of age, found twenty-five, or

TABLE 2.—POSITIVE REACTIONS IN CHILDREN OBTAINED BY VON PIRQUET

	Including Cases of Tuberculosis			Excluding Cases of Tuberculosis		
		Positive Reactions			Positive Reactions	
Age (Yrs.)	Total No.	Number	Per Cent.	Total No.	Number	Per Cent.
Under 1	410	21	5	388	0	0
From 1 to 2	116	24	20	89	0	0
From 2 to 4	208	74	35	162	22	13
From 4 to 7	264	127	48	189	53	30
From 7 to 10	216	138	64	154	74	48
From 10 to 14	193	155	80	147	105	70

TABLE 3.—POSITIVE REACTIONS IN CHILDREN OBTAINED BY HAMBURGER AND MONTI

		Positive Reactions	
Age (Years)	No. Children	Number	Per Cent.
Under 1	23	0	0
From 1 to 2	46	4	9
From 2 to 3	56	11	20
From 3 to 4	75	24	32
From 4 to 5	50	26	52
From 5 to 6	63	32	51
From 6 to 7	46	28	61
From 7 to 8	30	22	73
From 8 to 9	35	25	71
From 9 to 10	26	22	85
From 10 to 11	29	27	93
From 11 to 12	19	18	95
From 12 to 13	17	16	94
From 13 to 14	17	16	94

TABLE 4.—PERCENTAGE OF POSITIVE REACTIONS IN CHILDHOOD OBTAINED BY VARIOUS OBSERVERS

Name	Place	Number Tested	Age	Positive Per Cent.
Overland,	Bergen	843	From 12 to 14	50
Amenta,	Palermo	800	From 8 to 12	83
Müller,	Vienna	949	From 10 to 14	54
Calmette,	Grysez	1,226	From 5 to 15	81.4
Letulle,	Lille	...	From 12 to 16	60

38 per cent., of positive reactions. Taking the age period from 10 to 14, his positive reactions reached 63 per cent.

Cattermole quotes Manning of Seattle as having obtained 58.1 per cent. of positive reactions at the age period from 10 to 15, in a series of 228 children.

He also quotes Fishberg of New York, who, among 692 children living with tuberculous parents in the tenements, obtained 67.25 of positive reactions, while among 588 of the same class, but living with nontuberculous parents, 52.72 per cent. gave positive reactions.

Smith subjected 1,225 Indian children in New Mexico of school age to the test, and obtained 760 positive reactions, a percentage of 64.40.

TABLE 5.—TOTAL REACTIONS, INCLUDING CASES OF CLINICAL TUBERCULOSIS

	No. Children	Positive Reactions	
Age (Years)	Tested	Number	Per Cent.
Under 1	224	25	11
From 1 to 2	137	34	24
From 2 to 4	188	57	30
From 4 to 6	206	68	33
From 6 to 8	182	74	40
From 8 to 10	157	69	44
From 10 to 12	115	45	40
From 12 to 14	112	54	48
	1,321	426	

TABLE 6.—REACTIONS IN CHILDREN WITHOUT CLINICAL MANIFESTATIONS OF TUBERCULOSIS

	No. Children	Positive Reactions	
Age (Years)	Tested	Number	Per Cent.
Under 1	202	3	1.5
From 1 to 2	109	6	5.5
From 2 to 4	163	32	19
From 4 to 6	172	40	23
From 6 to 8	152	44	29
From 8 to 10	126	38	30
From 10 to 12	107	37	34
From 12 to 14	94	36	38
	1,125	236	

These findings are corroborated by postmortem examinations done on children who have died from various diseases.

The studies of Harbitz throw much light on this question. I give his results, as well as those of others, most of which are quoted from his monograph:

Harbitz, in 275 necropsies on children under 15 years of age, found 117 (42.5 per cent.) of tuberculosis.

Babes, in 902 necropsies on children under 15, found tuberculosis in 288 (31.9 per cent.).

In 1887, in ninety-three necropsies, tuberculosis of the bronchial and mesenteric glands was found sixty-five times. In only thirteen was death caused by tuberculosis.

Geill, in 902 necropsies on children under 15, found tuberculosis in 288 (31.9 per cent.). The maximum was reached at the period from 6 to 9, 46.9 per cent.

Müller, in 500 necropsies on children, found 150 (30 per cent.) cases in which death was due to tuberculosis, and fifty-nine (11.8 per cent.) of latent tuberculosis.

Hecker, in 700 necropsies on children, found active or latent tuberculosis in 147 (21 per cent.).

Monrad, in 654 necropsies on children, found tuberculosis in 157 (24 per cent.).

At the pathologic institute of Kiel, in 2,572 necropsies on children under 15, tuberculosis was found in 16.7 per cent.

Boltz, in 2,601 necropsies on children under 15, found tuberculosis in 428 (16.1 per cent.). Exclusive of those under 1 year of age, we have 1,171 necropsies with tuberculosis in 364 (31 per cent.).

Heller found latent tuberculosis in 140 (19.6 per cent.) among 714 children dead of diphtheria.

Councilman, Mallory and Pearce, in 220 necropsies on children dead of diphtheria, found latent tuberculosis in thirty-five (16 per cent.).

Hand, in 332 necropsies on children, found tuberculosis in 115 (34.6 per cent.).

Still, in 769 necropsies on children under 12, found tuberculosis in 269 (35 per cent.). In forty-three it was latent, and in 117 (43.4 per cent.) before the second year.

Many other similar reports could be given, but these have been selected as covering a large part of the world, and representing fairly the occurrence of tuberculosis as found postmortem in children.

Wallgren of Upsala has made some valuable clinical observations bearing on this subject. He compared the histories of 100 consumptives and 100 healthy persons as to their exposure during childhood. He took only those cases in which intimate contact during childhood with coughing consumptives could be affirmed with reasonable certainty. "Of the 100 tuberculous patients, fifty-one gave evidence of childhood contact with tuberculous associates, whereas of the 100 normal individuals, such contact was found in but thirteen."

It is impossible to escape the conviction that childhood is preeminently the time of life when the tubercle bacillus gains a foothold in the body.

ADULT INFECTION

The difficulty, especially marked in adult life, of connecting the clinical manifestations of tuberculosis with the date of infection, has already been mentioned, but fairly accurate information on adult infection can be obtained by the careful study of groups of individuals of good family history especially exposed to infection for considerable periods, such as physicians and attendants at hospitals and sanatoriums for tuberculosis, and those who marry consumptives. A number of collective investigations are quoted by Cornet and other writers. Many of these, owing to incomplete data and other defects, are of little or no value. From the material at hand I have tried to select those which seem to throw some light on the question.

Saugman states that of 174 sanatorium physicians, whose average term of service was three years, and whose subsequent history was followed for three and one-half years, only two became tuberculous. Among sixty-four laryngologists from eight different clinics, none contracted tuberculosis.

Williams has, in two papers, given most interesting facts concerning infection of physicians and attendants at Brompton Hospital, founded before the discovery of the tubercle bacillus, and before the contagiousness of tuberculosis was recognized. His first paper gave the statistics of the hospital staff from its foundation in 1846 to 1882, thirty-six years. Among four resident medical officers, one of whom held office twenty-five years, no case of consumption has developed. Among 150 house physicians, none of whom held office for less than six months, and many much longer, only eight cases of consumption occurred.

The second paper gives the results from 1882 to 1909. It includes resident and assistant resident medical officers, house physicians, resident and nonresident porters, pathologic assistants and dispensers, in all 369 persons, of whom twelve, or 3.2 per cent., developed phthisis later, two of them through inoculation wounds.

The comments of Goring on this report are most interesting. He compares these results with those obtained by himself in a study of 3,090 individuals of nontuberculous parentage, assuming that a person coming of tainted stock would not be likely to take service in a consumptive hospital. Among his 3,090 persons, seventy-nine, or 2.6 per cent. developed tuberculosis. Thus two groups, one exposed to special risks and one not, showed an amount of infection varying only 0.6 per cent. If the two hospital cases, associated with inoculation wounds, are left out of consideration, we have practically the same percentage of infection, 2.6 and 2.7 per cent.

Since the foundation of the Adirondack Cottage Sanitarium, more than twenty-eight years ago, there has been no case of infection among the employees, including waitresses, chambermaids and laundresses.

Infection through marriage may give some clue to the susceptibility of adults. Cornet says, "The number of cases of marriage infection, often of classical simplicity, runs up into the hundreds." His own study of 594 couples showed that in 23 per cent. both partners were tuberculous. He admits that the findings do not necessarily imply an etiologic relation between the cases. Cornet believes the actual cases run higher than the figures given indicate. Other observers place marital infection at from 3 to 12 per cent. Recent studies made according to modern statistical methods tend to throw doubt on the earlier work.[1]

The late E. G. Pope's study of this question failed to show definite proof of infection between married persons. His work has been reviewed by Karl Pearson, who says:

> I may conclude in the slightly modified words of Mr. Pope: It would seem probable then (1) that there is some sensible but slight infection between married couples, (2) that this is largely obscured or forestalled by the fact of infection from outside sources, (3) that the liability to the infection depends on the presence of the necessary diathesis, (4) that assortative mating probably accounts for at least two thirds and infective action for not more than one third of the whole correlation observed in these cases. But the demonstration of this result depends on the acceptance of the inherited diathesis to be effective, and the existence of assortative mating of equal intensity in the case of want of mental balance must prevent dogmatism. In all future collection of statistics with regard both to marital infection and parental infection, it is most important that the age of husband and wife at marriage and the age at onset and death in both should be recorded. Age at onset and death of the parent, age of parent at birth of child and age at onset and death of child should also be recorded. It is only by such complete records that we shall ultimately be able to accurately apportion the action of infection, assortative mating and inheritance.
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> For real light on the problem of assortative mating of the tuberculous, we must wait till we have definite knowledge in each case of the family history of both husband and wife. If we find (1) that the marriage of two ultimately tuberculous persons took place before either were suspected of the disease, and (2) that there is in such cases a larger percentage of family histories of tuberculosis than in the case of nonmarried tuberculous individuals, we should have definite evidence of the assortative mating which seems probable. If, on the other hand, the percentage were smaller, we should have definite evidence for the infection theory.

The difficulty of determining the date of infection by the appearance of clinical symptoms has already been mentioned. As our ideas have been in the past largely drawn from clinical data, it is evident that there is need of some revision. How such data may mislead is evidenced by the statement of Goring[2]:

> The mean age of onset for both sexes taken together is about 27—the standard deviation is about nine years. It follows from this that the ages between 14 and 45 may be looked on roughly as a danger zone for tuberculous infection. The modal value of age of onset is about 23, and this is the age when danger of infection is most intense, the danger diminishing fairly rapidly to the age of 14, and more gradually to the age of 45.

1. Prisons have been notorious for the many cases of consumption which developed among prisoners, and these figures have been used as demonstrating infection. I have purposely left these out of consideration in this paper because of the class of people affected. It is almost certain that the majority of these cases are simply instances of recrudescence of an infection which took place in early life. There is, at least, so much doubt concerning them that I have not considered the figures justifiable for use in this discussion.

2. Goring: Studies in National Deterioration, V.

It seems certain that the early years of life are those in which tuberculous infection takes place in the great majority of cases, and primary infection of adults is much less frequent than formerly believed. Clinical histories cannot be relied on to determine the period of infection. It seems equally certain that infection of adults does occur, and that no age is exempt.

CONCLUSIONS

1. The evidence at hand indicates that in the majority of cases the respiratory tract is the route of infection in tuberculosis.

2. The alimentary tract is a frequent portal of entry for the tubercle bacillus.

3. The tubercle bacillus is able to pass through the intact mucous membrane of the alimentary tract without producing a lesion at the point of entrance. This takes place most readily during the digestion of fats.

4. The bacilli pass with the chyle through the lacteals and thoracic duct into the blood, which conveys them to the lungs, where they are retained largely by the filtering action of the tissues.

5. Infection through the alimentary tract is especially frequent in children.

6. Infancy and childhood are preeminently the periods of life when the individual is susceptible to tuberculous infection, and the majority of cases of infection occur during these early years.

7. Any campaign against tuberculosis which leaves out of consideration the protection of children against infection will fail of success.

8. Tuberculous infection in adult life occurs, but not so frequently or readily as generally believed.

9. Tuberculous infection may occur at any age.

TRANSFUSION OF BLOOD WITH SPECIAL REFERENCE TO THE USE OF ANTICOAGULANTS*

HENRY S. SATTERLEE, M.D.
AND
RANSOM S. HOOKER, M.D.
NEW YORK

We previously reported[1] a method of transfusing blood by means of specially constructed pipets and cannulas designed for use with either a lining of hardened paraffin or a preliminary internal coating of an anticoagulant solution such as leech extract or herudin[2]. During the past eighteen months we have experimented with various anticoagulants other than paraffin and herudin, with a view to determining the best anticoagulative agents for purposes of transfusion. We desire here to report the results of these experimental transfusions and to summarize the theoretical and practical advantages of the anticoagulants which we have studied; and in order to make more evident at the outset the practical bearing of this study, we propose, first, to discuss briefly the present status of blood transfusion as a rational therapeutic procedure, and to call attention to certain aspects of this problem which are not usually taken into consideration. It is not our intention by this discussion to disparage the valuable and often brilliant results which have been and are being constantly achieved by blood transfusion, nor to argue for any special restriction of its field of usefulness, but we do wish to point out the need for a more exact knowledge of the biologic processes which are involved in transfusion of blood (or which may be involved under special conditions) in order that the certainty of its usefulness may be increased and that the liability to any untoward results may be minimized beyond what is realized at the present time.

In the constantly enlarging field in which transfusion of the blood is being employed, the questions which arise concerning the indications and contra-indications for this operation, the amount of new blood to be supplied, and the advisability of removing some of the patient's own blood at the time of transfusion, are all matters closely concerned with the probable benefit or futility of the operation. For instance, in the emergency of acute hemorrhage occurring in an otherwise healthy subject, or following the artificial removal of acutely poisoned blood, as in the treatment of gas poisoning, we believe that the problem is a comparatively simple one and that the established tests for hemolysis and agglutination between prospective donor and recipient are probably adequate, if indeed the urgency of the conditions may not make it imperative to proceed without taking time for even these tests. But the problem is far more complex when it is a question of the benefit to be derived from the transfusion of a so-called "normal" blood into the circulation of a patient suffering from one or more of the various pathologic conditions for which transfusion has been recommended, and we believe that this question could be more satisfactorily answered if laboratory methods were available for the detection of other possible grounds of incompatibility than those which are covered by the tests which are now in use.

Among the recent contributions to the literature of transfusion we can find only one reference[3] to accidents which appear definitely to suggest inadequacy of the present tests for blood compatibility, although there are numerous citations of unexplained chills and febrile reactions.

Percy[3], in a series of fifty-four transfusions, met with toxic reactions in three cases in which the hemolysis and agglutination tests were perfectly negative, and two of these cases resulted fatally.

Ottenberg and Kaliski[4] estimated that there are toxic reactions not referable to hemolysis or agglutination, in 10 per cent. of all cases of transfusion, which estimate appears to be based on their own series of 128 cases.

Ottenberg and Libman,[5] in their series of 212 transfusions on 189 cases collected from hospital and private sources and performed by a number of different surgeons, have contributed a valuable classified report. These authors, in summarizing the untoward results due to transfusion, assign the most unfavorable reactions of their series, including five fatalities, to "incompatible blood" (meaning, apparently, hemolysis or agglutination only) or to hypertransfusion. But they also state that a "more or less febrile reaction" occurred in about 10 per cent. of all cases and that skin eruptions, usually urticarial, occasionally petechial, appeared in another 10 per cent. In referring to the hemolytic and agglutinative reactions as being an insufficient guide to the value of a given donor's blood for the purpose of stimulating a remission of the disease in pernicious anemia, Ottenberg and Libman

* From the Laboratory of Clinical Pathology, Department of Medicine, College of Physicians and Surgeons, Columbia University, New York.

1. Satterlee and Hooker: Surg., Gynec. and Obst., 1914, xix, 235.
2. Satterlee, H. S., and Hooker, R. S.: The Use of Herudin in the Transfusion of Blood, THE JOURNAL A. M. A., June 6, 1914, p. 1781.
3. Percy: Surg., Gynec. and Obst., 1915, xxi, 360.
4. Ottenberg, Reuben, and Kaliski, David J.: Accidents in Transfusion, THE JOURNAL A. M. A., Dec. 13, 1913, p. 2138.
5. Ottenberg and Libman: Am. Jour. Med. Sc., 1915, xl, 36.

make the interesting observation that "there are probably other not yet recognized differences between the bloods of donors."

Lindeman[6] reports 4 chills and 14 febrile reactions in 46 transfusions with related donors, and 22 chills and 32 febrile reactions in 62 transfusions with unrelated donors.

Lewisohn[7] reports 5 febrile reactions and 3 chills in 22 transfusions.

Two cases of toxic reactions in which the hemolysis and agglutination tests were favorable have been reported to us by Dr. Robert A. Cooke of New York in a series of twelve transfusions.

Without going further into statistics it will be enough to say that those who have had experience with the transfusion of blood in varying pathologic conditions and by various methods have observed that certain toxic symptoms varying all the way from a slight chill and rise of temperature to marked anaphylactoid phenomena and even death have occasionally resulted as an immediate sequel to transfusion and where the usual serologic tests for hemolysis and agglutination have been entirely favorable.

An extended discussion of the available hypotheses by which to explain such phenomena would occupy too much space here, but we believe that certain grounds of explanation are more strongly suggestive than others and are therefore worthy of special attention. Recent researches on the blood, and especially on the action of serum ferments, have assumed a general significance as affecting many questions of immunity, and are most particularly pertinent to the problem which here concerns us. We will therefore consider three hypotheses, any or all of which may be applicable.

1. *It is possible that the trypsin-antitrypsin balance in the circulating blood of the recipient may be so disturbed by the commingling with the donor's blood as to result in the immediate formation of serotoxin from cleavage of serum protein.*

For instance, Jobling and Petersen have shown[8] that homologous serum may be toxic for animals under conditions which remove the antiferment and permit the serum protease to act, that[9] serotoxin (anaphylotoxin) formation is coincident with the adsorption of the serum antiferment and[10] that an increase of antiferment diminishes susceptibility to trypsin shock. These investigators have further demonstrated[11] that acute anaphylactic shock is accompanied by the intravenous mobilization of a large amount of nonspecific protease, a decrease in antiferment, an increase in noncoagulable nitrogen of the serum and an increase in amino-acids, which they attribute to the cleavage of serum proteins through the peptone (toxic) stage by a nonspecific protease. They conclude that the specific elements of this reaction consist in the rapid mobilization of the protease and in colloidal serum changes which bring about a change in antiferment titer, and that these changes are probably due mainly to an adsorption or lessening of the dispersion of the unsaturated lipoids on which the antiferment property depends.

2. *It is possible that the action of protective colloids in the body cells of the recipient may be so disturbed that these cells are thereby exposed to a reaction of antigen and antibody present in the circulation of the recipient but harmless to the protected cell.*

In support of such an explanation, the work of Zinsser and Young[12] on the possible importance of colloidal protection in certain phases of the precipitin reaction, has a distinct bearing.

If further investigation and better knowledge should prove the validity of these assumptions, it is most probable that laboratory tests can be evolved which will show in advance the liability to harmful results from such causes. Meanwhile it would be well to recognize that delicate physicochemical balances may be disturbed and toxic biologic reactions may take place as a result of transfusing blood under certain conditions, and that the usual tests for hemolysis and agglutination, although of primary importance, do not afford the complete assurance of freedom from unfavorable reaction which is commonly believed.

The increasing attention which is being given in the current medical literature to simplified methods of transfusion has tended to popularize the idea that almost any technic of operations may be employed which will serve to transfer blood under aseptic precautions and in a fluid state from the circulation of a donor to that of the recipient. As opposed to this trend of opinion, we believe that the removal of so complex a tissue as the circulating blood and its exposure to foreign physical influences during transfer to another human system should be regarded as at least as delicate an operation as the transplantation of any other living tissue, and should be given the same degree of consideration for favorable biologic conditions as any other surgical transplant. These conditions are not satisfied by providing only for the transfer of the blood in a germ-free and fluid state; they should also preclude the possibility of other changes tending to lessen its functional value as a transplant, and most particularly should the conditions preclude the possibility of harmful disturbances in the recipient's circulation induced by such changes. This brings us to another possible causation of toxic reaction which is not concerned with incompatibility between two bloods and which therefore is not to be anticipated by preliminary tests. This is:

3. *The possibility of a toxic disturbance in the circulation of the recipient by the introduction of blood which, though perfectly fluid, may nevertheless be undergoing incipient coagulative changes due to the physical influences to which it is subjected in process of transfer.*

Doerr[13] observes that substances which influence coagulation also induce anaphylactic manifestations, and he states that coagulative changes may produce such toxic reactions as evidenced by work carried out in his laboratory by Moldovan. Although Doerr specifically states that these effects may result from the injection of undefibrinated homologous blood, the only protocols which we can find of such experiments are those reported by Moldovan[14] demonstrating the fatal effects of the intravenous injection of recently defibrinated homologous blood. In explaining the anaphylactoid phenomena so produced, Doerr says that there is a reaction between an antigen and antibody, this being his conception of the incipient changes of coagulation according to the theory of Nolf, which results in an adsorptive action on the colloids of the blood, and that this latter disturbance —an essentially physical process—is responsible for the anaphylactic symptoms.

The mechanism of toxic action as suggested by this theory is similar to the two preceding hypotheses which we have introduced, in that all are concerned with adsorptive phenomena affecting the colloidal substances

6. Lindeman, Edward: Blood Transfusion, THE JOURNAL A. M. A., March 28, 1914, p. 993.
7. Lewisohn: Surg., Gynec. and Obst., 1915, xxi, 37.
8. Jobling and Petersen: Jour. Exper. Med., 1914, xix, 480.
9. Jobling and Petersen: Jour. Exper. Med., 1914, xx, 38.
10. Jobling and Petersen: Jour. Exper. Med., 1914, xx, 468.
11. Jobling and Petersen: Jour. Exper. Med., 1915, xxii, 401.
12. Zinsser and Young: Jour. Exper. Med., 1913, xvii, 396.
13. Doerr: Wien. klin. Wchnschr., 1912, xxv, 339.
14. Moldovan: Deutsch. med. Wchnschr., 1910, xxxvi, 2422.

of the blood or of the endothelial cells, and resulting in exposure to chemical change or physical shock. But the special significance of this explanation of toxic action is in connection with the physical influences to which the blood is exposed by the method of transfusion. Defibrination, either by agitation with glass beads or by "whipping," is, of course, an extreme degree of physical violence, but the argument of toxic effect from incipient coagulative factors applies, *pari passu*, with the lesser forms of physical violence which are incident in varying degree to any method of transfusion which is not a direct anastomosis. For instance, Minot[15] has conducted some experiments which demonstrate that blood allowed to remain in brief contact with the glass barrel of a syringe before being mixed with oxalate solution almost always clots when chloroform is added, whereas blood allowed to run from an artery through a paraffined cannula directly into oxalate solution does not clot on the addition of chloroform. Minot's explanation of this is that chloroform renders inactive the antithrombin, thus allowing any free thrombin present to clot the fibrinogen; so that in an oxalated blood the presence of free thrombin indicates that this thrombin was formed in the blood before the blood met with the oxalate influence. The effect of the glass syringe as causing this incipient thrombin formation is, of course, evidenced by his experiments.

The adhesive forces of capillary action, so-called, or, more definitely, the effect of surface tension forces, which act in and about any zone of contact with moistenable foreign surfaces, must be to set free thromboplastic substances in the blood by abrasion and disintegration of platelets. Other more obvious physical violence, such as forcing through small artificial channels, pressure from piston syringes, etc., would naturally increase this effect.

Anticoagulants.—The rational and most desirable function of an anticoagulant is therefore, in our conception of the premises, to restrain *incipient* coagulative changes at the zones of foreign contact, where such changes are most liable to occur. The use of an anticoagulant to render the blood incoagulable in mass, as with the calcium-converting agents, merely as an expedient for handling the blood in a fluid state, does not seem to us justifiable, not only because this involves mixing with the injected blood a much larger quantity of the anticoagulant than is necessary, but also because, by calcium inactivation, only the end-result of the clotting process is prevented. What assurance is there, for instance, that blood rendered incoagulable by citrate, but which has been subjected to physical contact with glass and metal surfaces, does not contain free thrombin, as evidenced by Minot's investigation, or a considerable amount of thromboplastin derived from contact with tissue juices and from the disintegration of platelets? In this connection it should be said that the preserving influence on the platelet cell membrane which is ascribed to sodium citrate can have no effect on the platelets which have already been disintegrated by passage through foreign channels before meeting the citrate influence.

Paraffin.—The natural advantage of the paraffin method for the transfusion of blood is the effectiveness of hardened paraffin as an anticoagulant without admixture of any foreign substance to the transfused blood. Objection to paraffin has nevertheless been made on the ground that special care is necessary to insure a perfect coating of the transfusion pipets or cylinders. It cannot be denied that special care in the matter of coating is essential to success, but the process is not a difficult one, and the mere trouble of coating in advance is offset by the convenience of having the pipets always ready for immediate use without further preparation.

Herudin.—The advantages of leech extract as an anticoagulant for purposes of transfusion may be briefly summarized: The derivation of herudin, the product of specialized glandular activity of the leech, indicates its biologic adaptation to the single purpose which it is known to serve in nature, namely, to prevent coagulation and thereby to facilitate digestion of blood in the stomach of the leech. From a physiologic standpoint it should be, and until recently has been regarded as, the ideal anticoagulant for animal experimentation. It acts not only as a preventive of platelet disintegration,[16] but it appears also to exert a neutralizing or binding action on the positive factors of coagulation (thromboplastin, prothrombin)[17] when these have been rendered active as a result of platelet disintegration.[18] Furthermore, it does not, as far as we know, disturb the protective lipoids of the tissue cells, as has lately been suggested[19] to be the action of the calcium precipitants and other calcium-converting agents.

As against the advantages which have just been enumerated, a very serious practical objection to leech extract has arisen in the uncertainty of procuring a reliable preparation of this substance. Quite recently Turner, Marshall and Lamson[20] discovered that a certain lot of the commercial preparation of "Hirudin" manufactured by Sachse & Co. of Leipzig, purchased by them in the early part of 1915 for use in their experiments with plasmaphaeresis, contained some very poisonous substance. Marshall,[21] in a special investigation of this subject, reviews the findings of other workers with herudin and reports experiments showing the action of aqueous extract of leech heads, as prepared by Abel, Rowntree and Turner[22] in comparison with similar experiments showing the action of the commercial preparation which contained the toxic principle previously mentioned. Marshall found that 20 to 25 mg. of this toxic preparation per kilo of body weight proved fatal for dogs, and ascribes its toxicity not to anything obtained from leech heads, but to some accidental product of putrefaction resembling sepsin. He confirms the findings of Abel, Rowntree and Turner,[22] that the aqueous leech extract, as obtained by their method, is nontoxic in quantities which render the circulating blood incoagulable. While referring to toxic reactions from the use of herudin it is important to call attention to the reactions noted by some observers who have employed much larger quantities of this substance for transfusion than we have advised. Lewisohn,[7] in attempting to employ herudin for his method of transfusion, experimented with the

15. Minot: Am. Jour. Physiol., 1915, xxxix, 137.

16. Bürker: Arch. f. d. ges. Physiol., 1904, cii, 92; Zentralbl. f. Physiol., 1907, xxi, 653. Deetjen: Ztschr. f. physiol. Chem. (Hoppe-Seyler's), 1909, lxiii, 1.

17. Mellanby: Jour. Physiol., 1909, xxxviii, 491.

18. Morawitz: Deutsch. Arch. f. klin. Med., 1904, lxxix, 215. Bayne-Jones: Am. Jour. Physiol., 1912, xxx, 74.

19. Overton: Arch. f. d. ges. Physiol., 1904, cv, 176. Boehm: Arch. f. exper. Path. u. Pharmakol., 1914, lxxv, 230. Clark: Jour. Physiol., 1913, xlvii, 66. Clowes: Proc. Soc. Exper. Biol. and Med., 1913, xi, 1. Clowes: Ibid., p. 4. Clowes and West: Ibid., p. 6. Salant and Hecht: Am. Jour. Physiol., 1915, xxxvi, 126.

20. Turner, Marshall and Lamson: Jour. Pharm. and Exper. Therap., 1915, vii, 145.

21. Marshall: Jour. Pharm. and Exper. Therap., 1915, vii, 157.

22. Abel, Rowntree and Turner: Jour. Pharm. and Exper. Therap., 1914, v, 257.

intravenous injection of large quantities of this drug and reported that the dose of 100 mg. of herudin caused death in one dog, no ill effect in a second dog, and most alarming symptoms in a postoperative patient, so that she was in a precarious condition for over thirty-six hours. Another physician has informed us that he employed this same dose (0.1 gm.) in transfusing two patients by means of Kimpton's cylinders. In one case there was no reaction whatever, and in the other case a very severe one. Whether or not any of these reactions were due to the use of a toxic preparation of herudin cannot be ascertained, but the dosage noted above is far in excess of what we have recommended or deemed advisable. Our observations with herudin have been confined to the commercial preparation manufactured by Sachse & Co., comprising five lots of 10 mg. tubes by chills and febrile reactions; and as these symptoms were associated only with the latter half of our herudin series, we are inclined to believe that they indicated some fault in the herudin which was used. Although we have never had any such reactions in our experimental transfusions with herudin while following precisely similar technic, this may be explained by the fact that we were working in the laboratory with a different lot of herudin; or it may be that dogs are less susceptible than human beings to the contaminating toxic substance which was discovered in the commercial "Hirudin" by Marshall, just as this author found that rabbits were much less susceptible to its effects than dogs. Other disadvantages of leech extract are that its activity is destroyed by heat sterilization, that it must therefore be produced under rigidly asep-

TABLE 1.—PRECIPITATION REACTIONS WITH CALCIUM CHLORID

Substances in Aqueous Sol.	Reaction to Litmus (L) and Phenolphth. (P)	Addition of 1% $CaCl_2$ Sol. in Small Amt.	Addition of 1% $CaCl_2$ Sol. in Excess	$CaCl_2$ Excess + Dil. HCl to Acid Reaction	Excess of Aq. Sol. of Substance to Already Formed Ppt.
Sodium citrate	Faintly alk. L.; Neg. P.	No ppt.	No ppt.	No ppt.	
Magnesium sulphate	Neg. L.; Neg. P.	No ppt.	No ppt.	No ppt.	
Sodium tartrate	Faintly acid L.; Neg. P.	No ppt.	Ppt. forms slowly on standing	Ppt. remains	Ppt. remains
Sodium metaphosphate	Faintly acid L.; Neg. P.	No ppt.	Ppt.	Ppt. remains	Ppt. dissolves
Dipotassium phosphate	Neg. L.; Neg. P.	Ppt.	Ppt.	Ppt. remains	Ppt. remains
Sodium fluorid	Alk. L.; Alk. P.	Ppt.	Ppt.	Ppt. remains	Ppt. remains
Sodium oxalate	Alk. L.; Alk. P.	Ppt.	Ppt.	Ppt. remains	Ppt. remains

TABLE 2.—EXPERIMENTAL TRANSFUSIONS WITH SODIUM CITRATE

	Amount of Solution Used, c.c.	Amount of Blood, c.c.	Amount of Anticoag. to 100 c.c. Blood, mg.	Clotting Time in First Tube, Min.	Clotting Time in Second Tube, Min.	Clotting Time of Residual Blood in Pipet, Min.
Sodium citrate: 10% sol. (1.40 m.). (Transfusion 1, Dog 1)	3	215	140	38	45	No sign of coagulation at 67½
Sodium citrate 10%, NaCl 0.8%, equal parts. (Transfusion 2, Dog 1)	1.8	215	42	10½	11⅓	No sign of coagulation at 50½
Sodium citrate 10%, NaCl 0.8%, equal parts. (Transfusion 7, Dog 2)	1	215	23	15⅝ 36½	10⅓ 27½	9⅝ 16½
Sodium citrate: 6.46% sol. (0.9 m.). (Transfusion 9, Dog 3)	1	215	30	11½ 11⅝	16⅓ 19	16½ 32⅝
Herudin 10 mg. in NaCl 0.9% sol. (4.5 c.c.). (Transfusion 10,* Dog 3)	1.5	215	1.5	16⅝ 23½	17⅝ 23½	31⅝ † 90
Sodium citrate 10% sol. (1.40 m.). (Transfusion 11, Dog 3)	1	215	46	12⅔ 18½	12⅔ 18½	Trace of fibrin at 39, still fluid at 24 hours ‡
Sodium citrate 10% sol. (1.40 m.). (Transfusion 15, Dog 4)	1	215	46	12 17	17⅔ 23⅔	No sign of coagulation at 24 hours
Sodium citrate 10% sol. (1.40 m.). (Transfusion 16, Dog 4)	1	215	46	21 27½	21⅓ 25⅙	No sign of coagulation at 90
Paraffin only, full coating. (Transfusion 17,* Dog 4)	0	215	0	15½ 17⅝	15½ 17⅝	15½ 18
Sodium citrate 10% sol. (1.40 m.). (Transfusion 27, Dog 6)	1	265	38	7⅝ 11⅝	no clot at 60	No clot at 60
Sodium citrate 10% sol. (1.40 m.). (Transfusion 28, Dog 6)	1	265	38	9⅛ 12⅛	no clot at 54	45⅝; 52 (incomplete)

* Transfusion 10 and transfusion 17 with herudin and paraffin, respectively, are included in the table for purposes of comparison. Where two sets of figures are given in columns five, six and seven, the first refers to first appearance of fibrin, the second to time of complete coagulation; where but one figure is given, the time of complete coagulation is indicated unless otherwise stated.

† Stained smear of this blood made at forty-three minutes showed normal staining and morphology.

‡ Stained smear of this blood made at forty-two minutes showed normal staining and morphology.

of this substance purchased prior to Jan. 1, 1915, and one lot purchased subsequently. We have never used, whether experimentally or in clinical practice, more than 7 mg. of herudin for transfusing 500 c.c. of blood, and in no one of numerous experimental transfusions on dogs have we had any ill effects from herudin in this proportion of admixture, although in some such cases we have removed and reinjected considerably more than the estimated total volume of the dog's blood. We wish, however, to record here the following interesting facts in this connection, which are derived from our series of clinical transfusions. We have made 14 clinical transfusions with herudin and 13 with paraffin. Among the 13 paraffin cases there were no chills or febrile reactions, nor have we had any such manifestations following our citrate transfusions. On the other hand, 6 of our 14 herudin transfusions were followed tic conditions, that it does not keep well in solution, and if so kept, should be preserved with the addition of some antiseptic such as thymol.

Inorganic Salts.—Many investigators have reported the effects on blood from a purely physiologic standpoint of various anticoagulant substances of inorganic origin. The work of Bürker and Deetjen,[16] Gessard,[23] Zucker[24] and Clowes,[25] is especially worthy of note in this respect. The observations here reported were made in the course of an experimental study of the anticoagulative effects of certain calcium-converting agents, to determine the minimal proportions of admixture with blood which would be needed for transfusion

23. Gessard: Compt. rend. Acad. d. sc., 1911, cliii, 1241; 1913, clxvii, 799.

24. Zucker: Proc. Soc. Exper. Biol. and Med., 1914, xi, 60.

25. Clowes: Proc. Soc. Exper. Biol. and Med., 1913, xi, 1; ibid., p. 4. Clowes and West: Ibid, p. 6.

with our apparatus and the relative safety and utility of these agents for this purpose. The following substances were selected for examination: sodium citrate, magnesium sulphate, sodium tartrate, sodium metaphosphate, dipotassium phosphate, sodium fluorid and sodium oxalate.

By reference to Table 1 it will be seen that, with aqueous solutions of sodium citrate and magnesium sulphate, no precipitate is formed on the addition of calcium chlorid, whether in acid or alkaline solution or in any proportion of admixture. With sodium tartrate and sodium metaphosphate a permanent precipitate is formed only when there is a considerable excess of calcium chlorid. In the case of sodium metaphosphate the precipitate caused by excess of calcium chlorid disappears with the further addition of sodium metaphosphate solution.

In determining the anticoagulative effect of these substances the plan of study was as follows:

A dog was anesthetized with ether and the jugular and femoral veins were exposed and served as donating and recipient vessels for autotransfusion. The transfusions were in all cases carried out by means of our special pipets and cannulas. During process of transfer, the pressure exerted on the blood averaged 40 mm. of mercury, and was controlled by a simple automatic contrivance so as never to exceed 80 mm. of mercury. The pipets were calibrated, of 300 c.c. capacity, and, just previous to use, were coated internally with an aqueous solution of the salt under examination. In each instance from 215 to 265 c.c. of blood were withdrawn from the jugular vein, which required about two minutes. As soon as the pipet was withdrawn from the cannula in the donating vein, about 5 c.c. of blood were immediately expelled from the pipet into a paraffin-lined test tube of 2 cm. diameter. The bulk of the blood in the pipet (from 190 to 240 c.c.) was then returned to the animal's circulation through a recipient cannula in the femoral vein, which required another two minutes, and, when this had been accomplished, another 5 c.c. portion of blood from the pipet was expelled into a second paraffin-lined test tube immediately on withdrawal of the tip of the pipet from the recipient cannula. The blood finally retained in the pipet, amounting to from 15 to 20 c.c., was laid aside and this portion as well as the two portions in the paraffin-lined tubes were inspected at short intervals for evidence of coagulation, and the elapsed time from the entry of the tip of the pipet in the donating vein to the first appearance of fibrin formation was noted, as well as the time when firm clotting occurred.

Inasmuch as dipotassium phosphate, sodium fluorid and sodium oxalate form precipitates with calcium chlorid (Table 1) they were left out of practical consideration at the outset and very little was done to determine their relative anticoagulative effects. Preliminary trials indicated that a solution of sodium tartrate equimolecular with 0.9 per cent. sodium chlorid (m 1.54) had only a feeble anticoagulative influence. A hypertonic solution (m 4.35) was therefore employed, but even with this concentration it was necessary to use from twice to ten times the amount necessary to coat the pipet in order to produce any appreciable anticoagulative effect. Magnesium sulphate in m 1.54 solution showed a greater anticoagulative action than sodium tartrate, but neither showed sufficient effect to warrant further investigation, inasmuch as both of these substances have been shown to have a toxic action when injected intravenously[26] which would render them undesirable for use in any quantity. It may be said, however, that in the amounts employed by us, neither of these agents appeared to exert any immediate effect on the experimental animal. The tabulated results of experimental transfusions with sodium tartrate and magnesium sulphate are omitted for the sake of brevity.

TABLE 3.—EXPERIMENTAL TRANSFUSIONS WITH SODIUM METAPHOSPHATE

	Amount of Solution Used, c.c.	Amount of Blood, c.c.	Amount of Anticoag. in 100 c.c. Blood, mg.	Clotting Time in First Tube, Min.	Clotting Time in Second Tube, Min.	Clotting Time of Residual Blood in Pipet, Min.
Sodium metaphosphate 1.57% (Transfusion 18, Dog 4)	1	215	7.3	11⅓; incomplete at 24 hours	No sign of coag. at 24 hours	No sign of coagulation at 24 hours
Sodium metaphosphate 0.8% (Transfusion 21, Dog 5)	1	215	3.7	9⅓ 11½	10½ 15	5⅔ 9⅔
Sodium metaphosphate 1.2% (Transfusion 25, Dog 6)	1	265	4.5	8½ 12⅔	22½ 24⅔	No sign of coagulation at 70
Sodium metaphosphate 1.2% (Transfusion 36, Dog 6)	1	265	4.5	12 16½	19⅙ 28⅓	No sign of coagulation at 64½
Sodium metaphosphate 1.46% (Transfusion 30, Dog 6, nine days after last transfusion	1	265	5.5	13 17⅓	No sign of coag. at 2 hours	No sign of coagulation at 2 hours
Paraffin only. (Transfusion 31, Dog 7)*.....	0	265	0	17 19	16½ 18½	16½ 18
Sodium metaphosphate 1.46% (Transfusion 32, Dog 7)	1	265	5.5	13½ 16½	18½ 24½	13½
Sodium metaphosphate 1.5% (Transfusion 33, Dog 7)†	1	265	4.0	12¾ 13½	8½ 9½	9 11
Sodium metaphosphate 1.46% (Transfusion 34, Dog 7)	1	265	5.5	8⅓ 12⅔	8⅓ 11⅙	‡ Faint trace of fibrin at 11. No further sign of coag. at 24 hr.
Sodium metaphosphate 1.46% (Transfusion 35, Dog 7)	1	265	5.5	7⅝ 11⅓	18⅓ 19⅝	13⅝ 15⅓
Paraffin only. (Transfusion 36,§ Dog 7)¶....	0	265	0	18 22	16⅓ 17⅔	14½ 18

* Coagulation time of Dog 7, at commencement of operation (4:10 p. m.) was 6 min. 15 sec. The coagulation times here noted were determined by allowing blood from the jugular vein to flow through a gold cannula (15 mm. long and 2.3 mm. diam.) directly into a clean glass test tube 15 mm. in diameter. Ten c.c. of blood was collected for each determination. The fluidity of this blood was examined every ten or fifteen seconds, and the time noted when the blood was sufficiently coagulated to permit inversion of the tube.

† Coagulation time of Dog 7, (4:42 p. m.) was 9 min. and 30 sec.

‡ Stained smear of this blood made at forty-five minutes showed normal staining and morphology.

§ Transfusions 31 and 36 with paraffin only were interpolated for purposes of comparison.

¶ Coagulation time of Dog 7 at end of operation (5:12 p. m.) was 7 min. 10 sec.

Having eliminated as undesirable five of the seven substances selected for study, there remains for consideration the action of sodium metaphosphate and sodium citrate. A synopsis of experimental transfusions with these agents is given in Tables 2 and 3.

Sodium Citrate.—The intravenous use of sodium citrate, in any quantity, as a therapeutic procedure, is open to ques-

26. Meltzer and Auer: Am. Jour. Physiol., 1905-1906, xv, 387. Joseph and Meltzer: Jour. Pharm. and Exper. Therap., 1909-1910, i, 24. Salant and Smith: Am. Jour. Physiol., 1914, xxv, 239.

tion on theoretic grounds from the experimental findings of several investigators, notably Gros,[27] Clark,[28] Sakai,[29] Salant and Hecht.[30] There is, however, the recent assurance of those who advocate sodium citrate as an anticoagulant for transfusion that this substance can be injected with transfused blood in considerable quantity. The amounts used by them in clinical practice range from 1.0 gm. (Weil) to 0.2 gm. (Lewisohn) per 100 c.c. of transfused blood. These authors say that they have seen no undesirable effect of such dosage, although Weil has noted a change in the coagulation of the blood. In commenting on the change in coagulation time, which is induced by citrate transfusion, Lewisohn[7] says that 300 c.c. of a dog's blood removed by his method of transfusion mixed with citrate (0.2 per cent.) and reinjected changed the coagulation time of the dog's blood from five minutes before operation to ten seconds when tested three minutes and again six minutes after operation.

Rous and Turner,[31] in reporting their findings with respect to preservative fluids for red blood cells, refer to the transfusion of exsanguinated guinea-pigs and dogs with citrated blood by Weil,[32] and state that, according to their observations, human cells and sheep cells rapidly disintegrate in citrated plasma, whereas in the preservative solutions which they have devised these cells survive for considerable periods.

Perfusion experiments indicate that sodium citrate has a potential toxic effect on the tissues of the circulatory apparatus which may be offset by the presence of available calcium, and that this toxic effect probably is prevented to some extent by the protective action of calcium ions in the tissues of the recipient. The mechanism of this protective action of the tissue calcium against the citrate ion is still a matter of speculation, but a most interesting and plausible theory of action has lately been formulated by Clowes[25] in a series of papers previously referred to. The extent to which this calcium-ion conversion occurs in the circulating blood and in other tissues would seem to depend on the amount of citrate which is introduced. Gros[27] and Salant and Hecht[30] found that sodium citrate has a toxic action on the isolated perfused frog heart, the latter authors demonstrating a well-marked effect in a concentration of thousandth-normal in Ringer's solution, and that it exceeded oxalate and tartrate in toxicity. Some as yet unpublished experiments in Professor Salant's laboratory in Washington[33] have shown that the intravenous injection of 100 mg. of sodium citrate per kilo in rabbits has caused serious symptoms and death.

Whatever the mode of action of citrated blood in transfusion, it is evident that when the citrate-ion concentration is sufficient to induce permanent incoagulability in vitro, the physicochemical effect in the circulation of the recipient must be considerable, and that this effect probably varies in direct ratio with the amount of citrated blood which is introduced. For purposes of transfusion, minimum amounts of this agent would therefore seem advantageous, and this point we believe worthy of special emphasis. We have previously found that the pipet-cannula method affords a technic which permits approximately one-eighth of the quantity of herudin which is necessary to produce an equal anticoagulative effect when using the simple syringe method; and a similar advantage is shown, by the present experiments, to hold true with sodium citrate. In coating the pipets with this anticoagulant, 20 to 30 c.c. of a 10 per cent. solution of sodium citrate is poured into the pipet just previous to use. This fluid is thoroughly flowed over the interior of the pipet by rotating it in the horizontal position and all excess is then allowed to drain out through the tip, leaving approximately 1 c.c. of the solution which adheres as a thin film to the glass wall of the cylinder. We have found (Table 2) that 100 mg. of sodium citrate (1 c.c. of solution), when so used as a liquid coating in one of our pipets, is amply sufficient for the purpose of transfusing 250 c.c. of blood when used with our cannulas, and that the only fully citrated blood so treated is that small residual portion (about 12 c.c.) which is retained in the pipets. That this residual portion of blood is usually subjected to a greater anticoagulant influence than the blood which is discharged from the pipet, may be seen by referring to the tables, and appears to be due to contact with a relatively larger proportion of the anticoagulant solution, which tends to remain adherent to the walls of the cylinder. Without making any deduction on account of this greater proportion of citrate solution, which presumably adheres to the pipet and is not transfused, but remains in the residual portion of blood, it is evident that not more than 38 mg. of sodium citrate per 100 c.c. of blood is necessary for transfusion by this method. This proportion of citrate is from one twenty-fifth to one fifth of the amounts which are recommended by those who have used citrate as an anticoagulant with other methods of transfusion, and we believe that this proportion can produce very little disturbance of the circulating blood of the recipient, inasmuch as there was no noticeable effect on the coagulation time of the blood of the animals used in our experiments.

During the past six months we have adopted this use of sodium citrate as an anticoagulant with our pipet-cannula apparatus in clinical practice and are well satisfied with its practical operation.

Sodium Metaphosphate: $(NaPO_3)_x$. The sodium metaphosphate used in these experiments was of C. Kahlbaum's manufacture, and consisted of broken bits of vitreous fused plates, having a conchoidal fracture and a solubility of 5.5 parts in 100 parts of distilled water at 15 C. A phosphorus determination, made for us in the laboratory of Messrs. Eimer and Amend, indicated that it contained two atoms of phosphorus in its molecule, corresponding to the formula $(NaPO_3)_2$ or $Na_2P_2O_6$.

As to the toxic effect on animals of this salt, our preliminary experiments by intravenous injection of 1.6 per cent. solution in rabbits show that the minimum lethal dose for rabbits is between 80 and 100 mg. per kilogram of body weight.

The results obtained in experimental transfusions with this agent are shown in Table 3 and indicate, by comparison with Table 2, that it has a more powerful anticoagulative effect than sodium citrate in proportion to its weight. The susceptibility to recalcification of blood treated with sodium metaphosphate as compared with blood treated with sodium citrate is a matter which we have, as yet, only touched on in our experimental work. We cannot therefore make any statement on the subject, as we have insufficient data for definite conclusions. It would appear, however, to be worthy of further investigation as tending to show what, if any, derangement of the coagulative mechanism is produced by these agents as regards subsequent reactivation by ionized calcium.

SUMMARY

1. A better knowledge of the physicochemical changes which may occur in the blood of the recipient as a result of transfusion in varying pathologic conditions is needed in order to define more clearly the rational indications for this operation as a therapeutic measure.

2. Certain hypotheses are suggested to explain the occurrence of febrile and toxic reactions following

27. Gros: Arch. f. Exper. Path. u. Pharmakol., 1913, lxxi, 395.
28. Clark: Jour. Physiol., 1913, xlii, 66.
29. Sakai: Ztschr. f. Biol., 1914, lxiv, 1.
30. Salant and Hecht: Am. Jour. Physiol., 1915, xxxvi, 126.
31. Rous and Turner: Proc. Soc. Exper. Biol. and Med., 1915, xii, 124.
32. Weil, Richard: Sodium Citrate in the Transfusion of Blood, THE JOURNAL A. M. A., Jan. 30, 1915, p. 425.
33. Personal communication.

transfusion which cannot be prognosticated by the existing laboratory tests for blood compatibility.

3. Importance is attached to the belief that many of the febrile and toxic reactions, not to be explained by hemolysis or agglutination, are due to the transfusion of blood which is undergoing incipient coagulative changes, or which contains potential coagulative factors such as thromboplastin and thrombin.

4. In judging of the safety of any method of transfusion, the extent and mode of action of the anticoagulant which is used, the toxicity of the substance, the amount of it which is necessary, and the mechanical technic in transferring the blood are the most important factors to be considered.

5. The employment of an antithrombin such as leech extract or the commercial "Hirudin," while appearing to be ideal as an anticoagulant from the physiologic standpoint, is subject to uncertainty of action and possible danger from contamination with toxic substances. Minimum doses of tested and standardized preparations and optimum anticoagulative technic should be used if such agents are employed.

6. The use of paraffin is theoretically the method of choice in providing an anticoagulant agent for purposes of transfusion and has been found practicable, but not without certain precautions and proper apparatus.

7. Of the inorganic calcium-converting agents which we have investigated experimentally, the citrate of sodium and the metaphosphate of sodium are the only substances which exhibit desirable characteristics. Both of these salts, however, have toxic effects which demand consideration of the amounts which can be safely employed for purposes of transfusion. Our experience with sodium metaphosphate is limited to experimental transfusion on animals.

8. Sodium citrate in the proportion of 120 mg. to 300 c.c. of blood, when used with the pipet-cannula apparatus and in the manner described, serves as an effective anticoagulant for transfusion. This proportion (0.04 per cent.) is from one fifth to one twenty-fifth of the amount of citrate necessarily employed with other methods. Because of the considerations which have been discussed, we believe it to be the best method of transfusion for general use.

Street Dust and Disease.—Following the announcement by the public health committee of the New York Academy of Medicine that a system of street cleaning which does not eliminate gross street dust and which employed dry sweeping methods cannot be satisfactory, a study was made by Prof. Thomas W. Hastings of Cornell University Medical School concerning the relation of street dust to disease. On examination of the available data he summarized his findings about as follows: Numerous bacteriologic examinations made in New York as well as elsewhere show that street dust contains a variety of living pathogenic organisms such as tubercle bacilli and various types of streptococci which are recognized as causative agents of many respiratory and other diseases. Although few authentic cases of disease can be traced to bacteria in street dust, yet the fact that appreciable numbers are found in street dust and inhaled or ingested, establishes a presumption that street dust may be the cause of disease. Studies of the incidence of respiratory diseases shows that persons free from exposure to city dust are less liable to suffer from such diseases. Dust has long been recognized as an injurious mechanical irritant and as a cause of lowered bodily resistance. Dry sweeping should be entirely abandoned, and street flushing should be introduced in street cleaning processes. All efforts should be made to render streets as free from dust as possible.

REACTIONS FOLLOWING BLOOD TRANSFUSION BY THE SYRINGE CANNULA SYSTEM *

EDWARD LINDEMAN, M.D.
NEW YORK

Since the simplification of technic,[1] blood transfusion has acquired considerable popularity. The syringe cannula system has greatly simplified the procedure over the old arteriovenous method. It now occupies a prominent and permanent place in the field of therapeutics. Today a hundred transfusions are performed where one was done but a few years ago. Though the technic has been thus simplified, there is a tendency on the part of some to slide over details of the work and, unequal to the task of even simple technic, they may resort to anticoagulants or inferior methods by which it may be possible to put blood into the patient even subcutaneously. The attempt to simplify the method further has not been attended without the sacrifice of important points of merit. The pitfalls and errors in the further simplification are the very things I have purposely avoided by the method originally outlined. The operative procedure is a life saving measure and should be regarded as something more than an injection of saline fluid or salvarsan administration, and any tendency to curtail detail of execution to meet the convenience or inexperience of the operator at the expense of the patient should be discouraged.

The reactions following transfusion will deter some from employing the measure with a patient in a critical state, in the fear of doing harm by the procedure itself, and the possible benefits to be derived may be overbalanced by the harm done. In order for any therapeutic measure to gain wide favor, it must be free of any danger incident to the procedure itself, or at least a very high percental relationship must obtain between risk and gain. It is my object in this communication to take up the problem of reactions to transfusion, to analyze their cause and to show the way to prevention.

In the first eighteen transfusions which I performed by the syringe cannula system, preliminary blood tests were made in only two instances. In this group of eighteen cases there were no chills and no fever reaction above 2 degrees. The quantity transfused was small—never more than 700 c.c. The donors used were immediate relatives of the patients, and the diseases treated were not primary blood diseases. (Primary blood diseases and infection offer most difficulty in finding compatible donors.) The conspicuous absence of hemolysis in the absence of blood tests in sixteen of these cases must be attributed to good fortune. Later in the course of the work, though blood tests were made in nearly all the cases, chills and fever were encountered more frequently.

In the first 150 transfusions which were performed by the syringe cannula system,[2] the incidents of chill followed by fever were approximately 33 per cent. The quantities transfused were usually 1,000 c.c. or more in adults. The work was done in many different

* Because of lack of space, this article is abbreviated in THE JOURNAL by omission of Table 1. The complete article appears in the author's reprints. A copy of the latter will be sent by the author on receipt of a stamped addressed envelope.

1. Lindeman, Edward: Simple Syringe Transfusion with Special Cannulas, Am. Jour. Dis. Child., July, 1913, p. 28.

2. Lindeman, Edward: Blood Transfusion, THE JOURNAL A. M. A., March 28, 1914, p. 993.

hospitals and in many different parts of the country; hence the preliminary blood tests of hemolysis and agglutination were necessarily done by many different serologists. In the report of this group, mention was also made of three cases of hemolysis which occurred. In these cases of hemolysis, the symptoms were carefully noted, and it was found that hemolysis is always accompanied by chills followed by fever. Hemolysis never occurs without chills and fever unless the patient dies during or shortly after the transfusion. The inference is therefore palpable that chills and fever reactions in transfusions are due to hemoglobin set free in the circulating blood. The reactions are clinically similar to the chills and fever occurring in malarial fever, and are undoubtedly due to the same factor, namely, hemoglobin set free in the circulating blood. When the hemoglobin set free is abundant, hemoglobin appears in the urine. When the hemoglobin set free is moderate, only hematoporphyrin appears in the urine. When the hemolysis is slight, the body is capable of utilizing and converting the slight amount of hemoglobin liberated, and no blood pigment appears in the urine. When no blood pigment appears in the urine, the danger incident to transfusion is practically nil. When blood pigment appears in the urine, the danger is very great and death may follow, especially when the patient is in an already precarious condition. The procedure when hemolysis occurs, even when death does not occur, is robbed of its therapeutic value.

In every case of hemolysis which was encountered clinically and in which the preliminary serologic tests were done, the hemolytic and agglutinin tests were repeated; and in each instance the incompatibility was detected in the second tests. The second tests were invariably performed by a different serologist from the first, who knew nothing of the circumstances. In one case opportunity was not offered to check up the accuracy of the laboratory work. Since the laboratory failed me in several instances, it became apparent that some laboratory workers have their limitations, and that this possible error must be eliminated. To do this, I set myself to the task of personally supervising the laboratory work in order to correlate the post-transfusion reactions with the tests. It was further apparent that if hemolysis, when hemoglobinuria occurred, was due to faulty laboratory work, it might be possible by careful and refined methods of selection to prevent even a slight degree of hemolysis when no hemoglobin appears in the urine, and the reactions following blood transfusion in terms of chills and fever might thus be eliminated. The results were gratifying, as is evident in Table 1. The tests were all made with very great care, and in some instances as many as twenty to thirty donors were examined from whom only one would prove satisfactory according to standard.

TECHNIC OF HEMOLYSIS AND AGGLUTININ TESTS

The red blood cells of patient and donor are washed three times with normal saline; variable quantities of patient's serum are placed in three separate small test tubes. To each of these are added 0.25 c.c. of a 2 per cent. suspension of washed blood cells of the donor. The same is done with the donor's serum and the patient's cells. Controls are made of donor's serum and donor's cells—patient's serum and patient's cells. Controls are also made with donor's cells in normal salt solution and patient's cells in normal salt solution. The total volume in each tube is raised with normal saline to 0.5 c.c. of volume. The test tubes are incubated in a water bath for a period of two hours, and readings are made. They are then set in the ice-box over night and readings are again made the following morning. When a case is urgent, the ice-box test is eliminated. The ice-box test should be eliminated only when absolutely necessary by the extreme condition of the patient where time is the important factor. When the amount of blood taken from the patient for tests is small, only 0.25 c.c. of serum is used, and controls of patient's serum are eliminated.

RESULTS

In the last 155 transfusions performed by the syringe cannula system, the preliminary blood tests have been personally supervised in all but nine instances. The reactions following transfusion appear in Table 1. Since the chills and fever reactions are due to hemoglobin set free in the circulating blood, it is necessarily a mass action and the degrees of reaction will depend on the amount transfused as well as the degree of hemolysis. Hence, if any hemolysis occurred, the reaction should be greater when a larger amount is transfused than when a smaller amount is given. Table 1 is intended to show quantities transfused, the disease treated, whether alien or family blood is employed and the degree of reaction following each transfusion.

In this table of 155 transfusions, not a single case of hemolysis and not a single death referable to the transfusion occurred. The tests were personally supervised in 146 transfusions, and they were not personally supervised in nine. There were in all sixteen instances of chills followed by a rise of temperature. There was a rise of temperature above 2 degrees without chills in twelve instances.

TABLE 2.—TEMPERATURE REACTIONS

Rise in Temperature		Fall in Temperature	
Rise, Degrees	Number of Instances	Number	Diseases	Fall, Degrees
From 2 to 3.....	18	1	Scarlet fever.....	2
From 3 to 4.....	2	1	Sepsis.....	1
From 4 to 5.....	5	2	Acute lymphatic leukemia.....	2, 1
From 5 to 6.....	3			
From 6 to 7.....	2	2	Typhoid.....	2, 3
		1	Sepsis and anemia....	4
		2	Aleukemic leukemia...	2, 1
		1	Septicemia.....	2
		1	Pernicious anemia.....	1

Of the nine cases in which the tests were not personally supervised, chills occurred in five instances, or 55 per cent. In 146 cases in which the tests were personally supervised, chills occurred in thirteen instances, or 9 per cent. Of nine cases in which the tests were not supervised, there was a rise in temperature in five cases, four of which varied from 2 to 3 degrees, and one from 5 to 6 degrees. When family blood was used, 4 per cent. had chills and 4 per cent. fever; when alien blood was used, 6 per cent. had chills and 16 per cent. fever.

In the 155 transfusions recorded in Table 1, there were 136,800 c.c. of human blood transfused with not a death referable to the transfusion. Adults received from 1,000 to 1,800 c.c. in each transfusion. Two donors were never used for one transfusion. The quantity enumerated was always taken from one donor. No foreign substance or anticoagulants were employed in any case.

CONCLUSIONS

1. The preliminary hemolytic and agglutinin tests when properly performed are reliable.

2. Incidents of hemolysis in transfusion can be eliminated entirely.

3. The reactions which follow transfusion when accurate tests are made are eliminated in all except 9 per cent. of the cases. In this 9 per cent. of the cases, chills and fever alone occur. When the quantity is 800 c.c. or less, chills and fever do not occur.

4. By careful, accurate and complete hemolysis and agglutinin tests, when the work is done skilfully, blood transfusion is robbed of all danger attending its use. This marks a step in advance because of the comparative simplicity of application.

COMMENT

In the technic of blood transfusion by the syringe cannula system, the entire mass of blood is outside the body for a period of between six and ten seconds regardless of the amount transfused. It passes through a minimum amount of foreign material. Embolism or clotting never occurs in transit. Syringes are never used for a second filling until thoroughly cleaned in sterile saline solution, because in evacuating contents of a syringeful of blood, a coating of blood remains on the inner surface of the syringe. When a syringe is refilled without cleaning, the plunger naturally rides over the blood cells adhering to the wall, crushing and injuring them mechanically. As the syringe is refilled, the injured cells are mixed in the blood stream and introduced into the patient. To prevent this, no syringe is used for a second filling until thoroughly cleansed with sterile saline solution. Syringes are cleaned as fast as they are used. Clotting in the syringe cannot occur, and the blood is transferred uninjured, exactly as it exists in nature. Anticoagulants or foreign substances are never employed. There is no blind system into which air may leak. There are no stopcocks, valves or rubber tubings about which blood may clot.

40 East Forty-First Street.

THE RELATION OF HEMOLYSIS IN THE TRANSFUSION OF BABIES WITH THE MOTHERS AS DONORS

THOMAS H. CHERRY, M.D.
Assistant Obstetrician Harlem Hospital; Instructor in Obstetrics, New York Post-Graduate Medical School and Hospital
AND
EDWIN G. LANGROCK, M.D.
Serologist, Harlem Hospital
NEW YORK

The new-born infant is subject occasionally to various pathologic conditions which to combat successfully requires the transfusion of blood. Among these ailments the most frequent and alarming, and perhaps most fatal, is the hemorrhagic disease of the new-born. The occurrence of this disease seems to vary in different institutions and localities. Townsend, collecting his reports from the Boston Lying-In Hospital, found that it occurred in thirty-two infants out of 5,000 births. Ritter found its occurrence in 190 cases out of 13,000 births at the lying-in hospital at Prague. Epstein, at the New York Foundling Hospital, found it in 8 per cent. of infants, while the average treatise of children's diseases gives the proportion of 1 in every 1,000 births.

Clinically this disease can be divided into two classes:

1. Those cases in which hemorrhage may occur from the mucosa of the gastro-intestinal tract, the stump of the cord, and subcutaneously, in all of which the diagnosis is easily made by the sight of a frank appearance of blood.

2. Those cases in which the hemorrhage may occur in some internal organ, such as the suprarenals, peritoneal cavity, brain, lungs, etc. It is in the latter cases, in which there is no apparent sign of bleeding, that the proper diagnosis may not be made at an early date; and when finally made, if the bleeding continues, the patient is almost exsanguinated, and the condition becomes a very grave and critical one.

In the treatment of this condition, the use of animal's or human blood serum injected subcutaneously seems to supply the necessary elements to the blood to cause clotting (Welch[1]).

Whole blood has also been injected subcutaneously for this ailment (Schloss[2]).

With the institution of these methods of treatment, the mortality has been lessened to a considerable degree as compared with the older manner of treatment. There are a great many failures, however, with a continuation of the bleeding process.

Other investigators, endeavoring to improve on the serum treatment, attempted the transfusion of blood with very striking results. The new blood supply adds those elements to that of the infant, which not only promote clotting, thereby causing the hemorrhage to cease, but at the same time increase its cellular elements and volume, thereby enabling it to carry on its functions in a proper manner. Among those advocating the immediate transfusion of blood for this condition, and whose results have been highly gratifying, are Green[3] of Boston and Lespinasse[4] of Chicago.

In the treatment of these bleeding babies by transfusion, we thought that the mothers might act as suitable donors for the transfusing of their own infants. As the maternal and fetal bloods in utero are so closely related, the cellular elements being separated by a thin membrane, but allowing for diffusion of chemical elements, it is the natural supposition that complete compatibility of infant's and mother's blood should exist. On consulting several well known serologists it was ascertained that all agreed on their probable compatibility, but they deemed it advisable to perform a preliminary hemolytic and agglutination reaction before using the mother as a donor for her infant. In view of this fact it was our idea to establish the complete compatibility of mother's and infant's blood by performing a series of hemolytic tests on newborn babies and their own mothers. There are several reasons why the mothers could be used as donors:

In the first place, when an infant has had a severe initial hemorrhage leaving it in an exsanguinated state, the delay in such a case in procuring a compatible donor on whom the preliminary tests should be made may be fatal to the infant. If it is known beforehand that the mother's blood is compatible, she can be used as the donor without the delay of making these tests, and perhaps the infant's life will be saved by supplying it in time with sufficient blood.

In the second place, when the bleeding is discovered during the night, the procuring of a proper donor would entail considerable delay; such an emergency

1. Welch, J. E.: Am. Jour. Med. Sc., 1910, cxxxix, 800.
2. Schloss, O. M., and Commiskey, J. J.: Spontaneous Hemorrhage in the New-Born, Am. Jour. Dis. Child., April, 1911, p. 276.
3. Green, C. M.: Boston Med. and Surg. Jour., 1914, clxxi.
4. Lespinasse, V. D.: The Treatment of Hemorrhagic Disease of the New-Born by Direct Transfusion of Blood, THE JOURNAL A. M. A., June 13, 1914, p. 1866.

can well be overcome by using the mother to supply the necessary blood.

In the third place, in certain localities where no laboratory is at hand and such a condition should arise, it is advantageous to know that a compatible donor is nearby.

Again, the element of expense enters into the transaction in a certain number of cases. By using the mother to supply the necessary 60 or 70 c.c. of blood there would be the saving of a laboratory fee and the payment of an outside donor, if no member of the immediate family were available.

It is well known that under certain circumstances emergency transfusions have been done without the preliminary hemolytic tests being performed, the operator trusting to good fortune as to the compatibility of the recipient's and donor's blood. Under these circumstances in the case of a bleeding baby it would be a safe thing to use the mother as donor. With this object in view, it was our intention to perform a sufficient number of tests on mother's and infant's blood to establish the fact of their complete compatibility, so that the mothers could be used in cases of emergency without fear of any injurious effect on their infants. It was first decided to perform 100 tests, but as the results were so uniform, thirty-four tests were finally deemed sufficient.

The following is the description of the tests carried out on patients in the obstetric ward of the Harlem Hospital:

All syringes, glassware and other materials used in the tests were dry sterilized. The mothers were bled by drawing from a vein at the bend of the elbow about 20 c.c. of blood. Five c.c. of this were placed in a test tube containing glass beads, and the tube was shaken for five minutes. This defibrinated the blood with resultant mother's corpuscles. The remaining 15 c.c. of blood were placed in a test tube on the slant and kept at room temperature until clotting had taken place. It was then placed in the incubator at 37 C. to facilitate separation of the serum.

Twenty-three babies were bled by making a deep incision in the heel, and the blood made to flow by making compression on the lower part of the leg. Blood from nine babies was obtained at the infantile end of the cord before ligation, and from three babies at the maternal end. This blood was treated in a like manner to the mother's. The defibrinated blood was washed and centrifuged three times in physiologic salt solution. Of the washed corpuscles a 5 per cent. suspension was made by taking 0.5 c.c. of corpuscles and 9.5 c.c. of saline. Of this 5 per cent. emulsion of red corpuscles, 0.5 c.c. was used, to which was added 0.5 c.c. of serum, so that mother's cells were treated with baby serum, and baby's cells were treated with mother's serum. Controls of saline and corpuscles, both mother's and baby's, were made in each case. The agglutination test was made grossly by the ocular method.

In the thirty-four tests that were carried out on the mothers and babies, no hemolysis or agglutination occurred. From these experiments we have concluded that all mothers can be used as donors for their infants in the transfusion of blood, provided no contraindications exist on the part of the mothers.

Since these conclusions have been drawn as the result of these hemolytic reactions, one bleeding baby has been transfused at the Harlem Hospital in the service of Dr. G. L. Brodhead. This infant began to bleed on its second day of life from the nasal mucosa, from the bowels, from the cord and from the kidneys. Without any preliminary blood tests the mother was used as a donor, and the infant was transfused with 60 c.c. of blood through its external jugular vein. The method of introducing this blood was by the indirect syringe procedure, and the apparatus devised by Dr. Lester Unger was used. One hour after the transfusion no bleeding occurred from the wound made over the jugular vein, and six hours later the stools were free from macroscopic blood and there was no further bleeding from any portion of its body.

It has been estimated that the volume of blood possessed by an infant is one twentieth of its body weight. In an infant weighing 7 pounds the amount of its blood supply would approximate 5⅝ ounces. A well known clinical observation is that if one third of the entire blood supply is lost by hemorrhage, there is grave danger of death taking place. Therefore, to transfuse a baby who has lost sufficient blood for symptoms of exsanguination to be present, it is important that a known quantity of blood be thrown into its circulation. If a too large amount enters the circulation, the heart muscle, already weakened by hemorrhage, may become acutely dilated, and death occur from a measure that is meant to be therapeutic. We have estimated that from 60 to 75 c.c. of blood are approximately sufficient to supply the infant with the necessary elements to promote clotting and enough cellular elements to replace those lost by hemorrhage. This is an important reason why the indirect method of transfusion should be practiced on these bleeding infants, as well as the argument for its simplicity of technic.

COMPLICATED NERVE TISSUE INVOLVEMENT ARISING FROM SYPHILIS OF THE VERTEBRAE

C. C. WHOLEY, M.D.

Instructor in Psychiatry, University of Pittsburgh, School of Medicine; Member of Psychiatric Staff, St. Francis Hospital; Assistant Neurologist, Western Pennsylvania Hospital

PITTSBURGH

Syphilis of the vertebrae has been infrequently reported. There were but 100 cases available for analysis[1] in 1912. Neural complications generally accompany this disease; they are often obscure, and many times are extremely grave. Frequently it is through some manifestation in the widely varying symptomatology arising from the nerve involvement that the existence of the osseous disease is suggested, rather than through any symptom arising directly from the spondylitis. It is with the neural features in syphilitic spondylitis that this paper deals.

A striking combination of such neural complications as may be found in this disease was presented in one of my recent cases, which well illustrates the diversity of clinical manifestations which may spring from such spinal axis involvement:

On admission to the hospital, the patient showed alarming symptoms arising from loss of sensation about the larynx, pharynx and esophagus. This impaired sensory condition pointed to disturbance in the cervical and medullary regions of the cord. There was at the same time loss of sensation in

1. Hunt, J. R.: Am. Jour. Med. Sc., August, 1914.

the bladder, rectum and lower extremities. The latter sensory condition pointed to disturbance in the lumbosacral region of the cord.

There was some ulceration of the pharynx, and an obstinate cough occurring frequently in paroxysms, attended by the expectoration of thick whitish sputum in great quantities and by the regurgitation of food. The patient soon became unable to swallow at all, being given all nourishment through the stomach tube, and rapid emaciation took place. The history elicited some significant facts: There had been attacks of sore throat and "rheumatism" for the past seventeen years. (The patient was a man aged 52.) There had been an attack of gonorrhea at 21. For a year and a half "things hadn't tasted right"; there had been anorexia, flatus and obstinate constipation. The use of alcohol, excessive for a number of years, had been discontinued for a year and a half.

The urgent throat and respiratory symptoms demanded immediate attention. Laryngologic examination made by Dr. Chevalier Jackson demonstrated the following:[2]

"Laryngeal motility was found to be perfect. The pyriform sinuses were full of secretions. A bronchoscope was passed to the bifurcation of the trachea without anesthesia, general or local, and there was not the slightest sign of a cough reflex. Esophagoscopy showed presence of cricopharyngeal and hiatal contractions, though very weak and unlike normal spasmodic resistance to the advance of the esophagoscope. A 10 mm. by 53 cm. esophagoscope passed readily into the stomach. There was no gagging, retching or attempt at vomiting. The author made a diagnosis of sensory paralysis, with consequent absence of the normal serial deglutatory reflex."

The neurologic examination (case referred to me by Dr. E. B. Haworth) revealed not only subjective symptoms confirmatory of the foregoing cervical involvement, but also subjective symptoms pointing to lumbosacral involvement. Indicative of the lumbosacral disturbance were: a feeling of numbness and weakness in the legs, having covered a period of two years, and often being accompanied by a sensation of pin-pricking in the thighs; latterly there had been obstinate constipation; the patient had been entirely unaware of any desire to urinate or defecate for the past month, merely going mechanically at stated times for the performance of these functions; the urinary stream was started by the patient placing his hand in cold water, or by the sound of running water (psychic stimulus); the patient had been impotent during the past two years, though normal sexual desire had been present. The mental condition was normal except for considerable anxiety regarding himself.

My report on the reflexes was as follows: pupils irregular and unequal (right, 4 by 4, wider below; left, 3½ by 3½, wider above); reactions to light and accommodation about normal; arcus well marked. Reflexes in upper extremities equal on the two sides but somewhat exaggerated. The knee jerks were entirely absent; plantars lively and no Babinski; abdominal skin reflex absent and cremasteric very sluggish. There was some rombergism. The spine below the lower dorsal region was held rigid during attempts to bend the trunk forward, and the knees had to be flexed if this angle exceeded 40 degrees. Sensation for pain was diminished from the crests of the ilia to the soles of the feet, increasing from above downward, with the analgesia very marked about the soles. The patient could pucker the lips, but the tongue protruded slightly to the left.

The laboratory reported that the sputum was negative for tuberculosis; the urine exhibited a slight glucose reaction; there was moderate blood leukocytosis and the Wassermann was negative. The spinal fluid showed 5½ lymphocytes to the cubic millimeter with heavy globulin precipitate.

The roentgenographer reported an osteo-arthritis of the lumbar and cervical vertebrae; numerous small osseous spicules could be seen projecting especially from the lips of the vertebral bodies.

The roentgenographic report was of the greatest assistance in affording an explanation for the neural complications. It was probable that the symptoms were, in large measure, a result of compression of the spinal cord and nerve roots by the exudative processes incident to the spondylitis. The striking characteristic of this case was that the symptoms were almost entirely sensory in character. There was a remarkable parallelism between the symptoms affecting the centers in the medulla (those controlling deglutition, coughing, respiration, etc.), and those in the lumbar region (sacral segments—those controlling micturition, defecation, erection, etc.). Above, sensation was lost in pharynx, larynx and esophagus; below, sensation was lost in the bladder, rectum and genitalia. In other words, the upper reflex arcs, on whose integrity the acts of swallowing, normal respiration and coughing depended, were paralyzed on their sensory sides, while the lower reflex arcs for micturition, defecation, erection, etc., were paralyzed on their sensory sides, also. All of these reflexes were either abolished or greatly crippled.

Such a similarity in lesion indicated a common causative agent. The course and duration of the symptoms, their unusual and symmetric distribution, not corresponding with those of any of the systemic nervous diseases, together with laboratory reports, pretty definitely eliminated tuberculosis and carcinoma, the two diseases most likely to come into question in view of such symptomatology. Alcohol, even as an active contributing factor, could be excluded on the ground of its having been discontinued for the previous year and a half. Rheumatoid arthritis does not exhibit such sporadic spinal distribution. Therefore, though history of syphilis had been denied (Neisser admitted), and in spite of a negative Wassermann,[3] a diagnosis of syphilis of the vertebrae, manifesting itself through its effects on the medulla and cord, was made. The heavy globulin reaction in the spinal fluid indicated an active inflammatory process. The sensory symptoms were indicative of pressure rather than of meningeal irritation alone.

A consideration of the course of the spinal segments through the intervertebral foramina, and of the cranial nerves (ninth, tenth and eleventh) along the base of the skull and through the jugular foramen, makes plain the pressure possibilities to which these nerves might be subjected by the acute inflammatory exudative processes incident to the osteitis which was revealed by the Roentgen ray. It should be noted in this connection that bone syphilis affects the base of the skull and the cervical vertebrae more frequently than other parts of the vertebral axis.

The unlimited variety of symptoms, arising from the manifold neural lesions occurring in syphilis affecting the central nervous system, is exemplified in this case by still further ramifications of the disease process. The anesthesia of the lower extremities indicated that the pathologic condition extended beyond the sacral segments into the lumbar segments of the cord which supply the skin area, in great measure, of these extremities. There was also some extension of the pathologic condition in the cervical region beyond the cranial nerves mentioned, as evidenced by a "girdle sensation" in the arms, pupillary, tongue and taste deviations, and transient diaphragm palsy. There was further evidence of motor involvement in the fact that there was a left shoulder-arm paresis, this pointing to brachial plexus implication.

Immediately on the institution of antisyphilitic treatment (mercury and potassium iodid), symptoms began to show improvement. Just before the treatment was begun there was an alarming crisis characterized by extreme dyspnea, the respiration becoming of the Cheynes-Stokes type, nausea, with paroxysms of abdominal coughing in attempts to expel the tenacious mucus, the pulse was weak, and the face was cyanotic. Oxygen and other stimulants were used. Within

2. Jackson, Chevalier: Peroral Endoscopy and Laryngeal Surgery, St. Louis, the Laryngoscope Company, p. 557.

3. Whitney, J. L., and Baldwin, W. I.: Syphilis of the Spine, THE JOURNAL A. M. A., Dec. 4, 1915, p. 1993.

a week after treatment had been begun, coughing and sputum were much less and respiration was easier. By this time sensation was beginning to return over the thighs and legs; but there was no sensation until later for pain or pressure over the buttocks, scrotum or the soles of the feet. Persistence of anesthesia in these localities may be accounted for by the fact that the osseous process impinged most markedly on the sacral segments of the cord. At the end of two months the patient was able to swallow solid food, and fairly normal sensation for urination and defecation began to be experienced. In a short time the patient returned to his regular occupation of salesman, at which, a year and a half later, he is still engaged. At present the patient complains of weakness in the left arm and some numbness in the soles of the feet.

The extent of the symptomatology here again drives home the fact that the importance cannot be overestimated of eliminating cerebrospinal syphilis as etiologic in every obscure or indefinite clinical picture. The foregoing is but one of numerous instances, coming under observation, in which final decision as to diagnosis has rested on clinical findings in the face of negative laboratory reports.

THE RELATION OF THE LABORATORY COURSES TO THE WORK OF THE CLINICAL YEARS *

ELIAS P. LYON, PH.D., M.D.
Dean and Professor of Physiology of the University of Minnesota Medical School
MINNEAPOLIS

First, I tried to work out this relation on the family basis. I said, "Medicine is the mother of physiology," and I prepared to come here and paint a pretty picture of physiology taking care of mother in her old age. But when I looked around for father, my trouble began. I found that medicine had a promiscuous lot of children—quite a heterogeneous household ranging all the way from substantial oldest son, anatomy, to sapheaded chiropractic. I became fearful of discovering a scandal and gave up the idea of family relationship.

Then I thought it might work out better on a basis of phylogeny. "I will construct," I said, "a scheme of relationship by descent. I will study the evolution of the medical sciences—develop the tree of race relationship."

The plan looked hopeful. There was the gnarled but sturdy old trunk of medicine extending down into the subsoil of unrecorded history. Even as deep as one could trace the roots there were nodules of anatomic fact apparently flourishing and metabolizing nitrogen in a moldy sap-wood of religious superstition. But after I had thus got anatomy nicely placed among the roots, I wanted to use it later as a branch, and encountered botanic difficulties. The only thing I could think of was a banyan tree.

Moreover, considering the religious affiliations of medicine in history, I was afraid if I established evolutionary relationships I should find Christian Science as a large, green and flourishing branch of the medical tree. Then, too, I found that medicine interbred with every science and every form of speculation. I observed that ophthalmology was medicine crossbred with physics. I considered that bacteriology evolved from the false philosophy of spontaneous generation and got itself grafted into medicine secondarily. My tree would not grow according to good botanic principles. I foresaw such a storm about acquired characters and sports and cross-fertilization and mendelianism that I gave up the theory of evolutionary relationship.

Next I tried the analogy of master and workman. I recalled a word frequently heard at these meetings, a fine sounding, resonant word: "ancillary." The ancillary sciences working for the master science of medicine. It sounded pretty good and seemed capable of development as the text for this occasion. But I looked up "ancillary" in the dictionary and found it was derived from a word meaning female slave. I began to imagine medicine not exactly as a science but rather as a gatherer of science's harvest—medicine as the slave owner living in the big white house. That was familiar. But I saw also poor physiology, the female slave, scourged to her quarters. Serene in the manifest superiority of the spirit, she nevertheless appeared the helpless victim of an hereditary ruling class. I could not stand such a picture, and gave up the relation of master and servant as the analogy for this symposium.

By this time the hour of this meeting was drawing near. I saw that if I were intelligently to discuss the relation between the laboratory sciences and the work of the clinical years, I needed to know something about the clinical years. So I followed a master of diagnosis in his day's work. I saw him percuss and auscultate; I saw him count corpuscles and analyze excreta; I saw him elicit reflexes and measure temperature; I heard him speak of valves and pressure and enzymes and neurons and calories. I said: "That man is not practicing medicine. He is practicing physiology." I watched a therapeutist at the bedside and found that he was not practicing medicine but pharmacology. I saw a surgeon earning a thousand dollars. I discovered that he was not practicing surgery but anatomy, pathology, physiology and—high finance! Finally, the relation I was seeking came suddenly into mental view. Anatomy and physiology and pharmacology and bacteriology and chemistry and the rest are not the children of medicine; they are not the branches of an evolutionary tree; they are not handmaids; they are not stepping stones or preparatory stages. They are IT. They are medicine itself.

Every correct observation of function or disorder, every established fact of structure, every corroborated discovery in the field of causation or in the domain of restitution, every correctly interpreted experiment in test tube, animal or man, whether made by layman or practitioner or professional scientist, is describable in the terminology of the fundamental sciences, and is really a constituent part of those sciences. These make up medicine as a real living body. For clothing there is folk psychology, a modicum of ritual, that indefinite confidence-producing mantle called personality, a veil of magic, and a vanishing hat, labeled "empiricism," with a hole in it through which talking may be done. But all these are outward habiliments. The warm, breathing, vital entity is science—the medical sciences or the science of medicine.

To this fertile thought I invite your attention. I acknowledge that it is perhaps only a half truth. But

* Read in a symposium on the "Relation of the Laboratory Courses to the Work of the Clinical Years," at the Twelfth Annual Conference of the Council on Medical Education of the American Medical Association, Chicago, Feb. 7, 1916; abstract of discussion, Society Proceedings, THE JOURNAL A. M. A., Feb. 19, 1916, p. 596.

who wants to hear the whole truth? The whole truth is too static, embalmed, petrified. I acknowledge, too, that our thesis is not wholly consistent; but consistency, you remember, is a jewel, and as such reserved for the ladies—and special occasions.

Anatomy, chemistry and the rest are not preparatory to medicine, they are medicine itself. They are provinces, not independent kingdoms. The doctrine of sovereignty does not hold among the sciences nor in medical teaching. Boundaries are set, but they are imaginary lines, not Chinese walls. They do not impede the exchange of ideas nor hamper the free movement of the products of research.

"But surely," some physicians will say, "Surely such extravagant statements should not be permitted to go unchallenged. We admit that some anatomy is medicine; that some physiology is medicine. But a good deal of anatomy is just anatomy; a good deal of physiology is just physiology. And surely medicine is more than these sciences." I am prepared to defend my trenches against such bombardment.

If some physiology is medicine and some is not, it is implied that some one should select what is and what is not. It is further implied that what is medicine should be taught to medical students, and what is not medicine should either be omitted from the curriculum or gingerly and to a limited extent admitted to keep the physiologist good-natured. Something like this reasoning influences the clinical teacher when he approves of our teaching the number of corpuscles and the character of the heart sounds and the percentage of hydrochloric acid, but decries the work on muscle and nerve or the teaching of physicochemical theory. But surely if the medical practitioner is to be more than a pill-roller, if the surgeon is to be more than what one well-known surgeon calls himself, a plumber, it must be because there is in him that lively appreciation of fundamental biologic facts which makes him picture the marvelous mechanism of the body responding to the multitudinous and varying stimuli of the environment. There is no class of experiments so well adapted to give such a concept as those on muscle and nerve. There is no single experiment so useful for teaching the essentials of deductive logic as the curare experiment. There is nothing so essential for medical progress as the intelligent use of hypothesis. The physiologic theories of the nature of stimulation, conduction, secretion and contractility are inspiring examples of the hypothesis as an effective weapon in the boundary warfare between ignorance and knowledge—a warfare in which every progressive medical man should be enlisted for lifelong service.

Indeed, if I analyze the working of the clinical mind correctly, it makes use unconsciously of the concepts and theories derived from the fundamental sciences, which on the surface of consciousness it denunciates as unpractical. They are unpractical perhaps in that they do not make for a defter hand or a sharper eye. But they are intensely practical as the invisible warp into which is woven the thought stuff for "practical" conclusions.

There is another side to this proposition. If we acknowledge that a given fact or theory is devoid of practical value today, who shall decide as to the future? In my teaching experience I have seen the taking of blood pressure transformed from a laboratory fad to a clinical routine; I have noted embryology influencing surgical procedure; I have seen the action current become the basis of electrocardiography; I have seen the theoretical chemistry of the proteins become the cornerstone of dietetics; I have seen men who, as students, complained of the introduction of physical chemistry into physiology, later as clinicians attempting to measure and understand hydrogen ion concentration.

Let us not, then, be too narrowly restrictive with the fundamental departments. Whatever is good anatomy is good medicine. Whatever is good physiology is good medicine. In giving the well-rounded training which will make his science a living entity, the anatomist or the physiologist or the pathologist or the chemist may be trusted to include the so-called practical matters which are the outward manifestation of medical practice, just as he may be trusted to do his best to instill the methods and powers of observation, experimentation and orderly reasoning which should be the inward essence of medicine itself. He may be trusted, I add, so to steer the ship of research that, though it skirt uninhabitable shores and though it penetrate many an unpromising inlet, in the end it will discover safe anchorage and will chart out passages by which the commerce of applied science may pass into now unknown seas.

I regard our combined courses and the arrangements by which the science departments belong alike in the college and in the professional school as an admirable device for avoiding, on the one hand, too remote and general development, and, on the other, a narrow utilitarianism. The latter, to my mind, is the popular error. We worship Edison instead of Faraday, Lister instead of Pasteur. Of the commoner sin we should be most on guard.

Again, if my thesis as to the nature of medicine is correct, and if the student in his first two years is as truly learning medicine as in his last two years, we should all unite to disabuse his mind of its familiar error as to the nature of the laboratory courses, and get him to see the steps of his education in a truer light. In this the clinical teachers can be of great assistance. In this, too, if anywhere, lies the justification for clinics and lectures by clinical men to make clear to freshmen and sophomores the application of the facts and theories which they are learning in the fundamental departments. That clinicians in order to do such work satisfactorily should be thoroughly trained in and sympathetic with the sciences goes without saying.

The obverse is equally true. As clinical teaching becomes more scientific, the student is likely to see in his later years the necessity for further laboratory training. And we have the argument for such an arrangement of curriculum, such a recognition of the elective principle and elastic program that he can get this training easily and systematically.

Moreover, if my thesis is even approximately correct, the professors of surgery and medicine should expect to teach anatomy, physiology, pathology, etc., as part of their regular work. Instead of complaining because the students who come to you do not know it all, you should look on yourselves as duly appointed to teach these sciences and to continue the training of the juniors and seniors along the very lines laid down in the first two years. Thereby the marked break at present existing between the first two years and the last two years would in large measure be avoided.

In the text of this homily lies, furthermore, the best argument for the unity of medicine. Did anyone ever

hear of chiropractic chemistry or osteopathic physiology or even homeopathic pharmacology? There are no sects in science. There will be none in medicine when medical men and their patients appreciate what medicine is and what it can do and cannot do. That joyful but distant millenium awaits the universal development of the scientific mind. It may come. Who knows? Think of the progress of the last four hundred years. Let us begin by making the doctors more scientific.

Finally, if my thesis and what I have founded on it are correct or only half correct, there can be no doubt that clinical teachers should be better trained in the sciences than has been common in the past. The ideal clinical teacher is one who has founded an adequate training at the bedside on from three to five years of graduate study in a productive teaching laboratory, or who has served as assistant for a long time in a clinic which has as adjuncts such laboratories with trained scientific leadership. This is the reform for which Graham Lusk has worked in New York, and which many medical educators have recognized of late as the greatest need in our schools as a whole. Unfortunately, conservatism and vested right and, worst of all, a dearth of teachers of this type, have made progress slow. But I believe we have passed the critical point and that development in the clinical branches is about to parallel that which took place a few years ago in the scientific departments. Men are beginning to prepare themselves for clinical positions as definitely and from the same professional standpoint as for positions in the laboratories of anatomy, physiology and pathology. We in administrative authority in universities are beginning to look for a clinical teacher in just the same way that we look for a chemist or a historian. I am persuaded that in our clinical departments in the next generation we shall have leadership and a nucleus of organization in practically full-time teachers who have had intensive laboratory training and are primarily medical scientists. Around this nucleus will be part-time men who practice medicine as well as teach, and who carry into both the ideals and the habits of thought of the scientific leaders. Beyond these I see a great profession increasingly benefited and ennobled by the same ideals, habits and methods reflexly acquired while in school and enforced in after life.

This is my thesis, my creed, my optimistic hope. It is in the failure of us science teachers to realize our part of it that I find my moments of discouragement. In how many of our students do we fail to establish logical habits of thought, fail to create a critical attitude toward authority, fail to found a confident reliance on observation accompanied by an appreciation of the limitations and pitfalls of the senses, fail to awaken the imagination and to kindle such a fervor for science that the constant cry shall be "What, How and Why," fail to establish sleepless guard against that insidious enemy of the understanding, *post hoc ergo propter hoc* —in how many of our students, I say, do we science men fail to do these necessary things? The number is large, I am sure.

I try to believe that our poor results are due to poor training in the premedical years, or in high school or earlier still. I try to convince myself of the inherited inability of many to observe correctly or think logically. I try to persuade myself that we turn over to the clinical teachers a pretty good product, and that the latter destroy our good work by methods of didacticism, empiricism and worship of authority. Nevertheless, with all due allowances I come back to the physiologic laboratory in fear and humility, for I feel that better pedagogic leadership would give better results. I wonder whether we shall some day have medical normal schools and teachers who shall teach us how to teach.

RELATION OF THE PRECLINICAL LABORATORY COURSES TO THE WORK OF THE CLINICAL YEARS*

LEWELLYS F. BARKER, M.D.
Professor of Clinical Medicine, Johns Hopkins University
BALTIMORE

The problem of the relation of the preclinical laboratory courses to the work of the clinical years is one that must interest every teacher and every student in a medical school. It is a problem that will often occur, for the aspects of medicine as a whole and of its constituent and underlying sciences are ever undergoing changes that require, at comparatively brief intervals, corresponding readjustments of the medical curriculum. The most that we can do at any one period, after formulating sound general principles regarding the relationships that should exist, is to make the adjustments desirable for the period, understanding that these adjustments are but temporary and must, of necessity, give way, later on, to others.

That I have been invited to participate in this discussion is, I take it, partly because of the schools in which I have had opportunity to teach, but more because of the fact that for twelve years I was a teacher of two of the preclinical laboratory sciences (anatomy and pathology), and that for the ten years which followed I have been almost wholly engaged in the teaching and practice of clinical medicine. This experience has given me sympathy with, and at least a certain understanding of, the aims and needs of both the preclinical and the clinical sciences. Several ideas regarding the principles that should be followed in planning the medical curriculum and regarding the readjustments of the present methods of teaching seem to me valid, and I shall be glad to know whether or not you, also, approve of them.

The reinstatement of the medical faculties of our universities in the respect of the world of scholars has undoubtedly been due to the astonishing growth of the scientific spirit among medical men and to the remarkable expansion of our knowledge of man and of the diseases that endanger his life and his health through the rise of the methods of research in the natural sciences. These methods have been and are now being applied with great zeal to the study of the structure and function of living organisms. No small part of the progress has been due to the devising of new methods of investigation that have been perfected in laboratories. Intensive work has required an ever-increasing division of labor in research, with specialization of the fields of investigation and constant additions of departments and professorships in our universities and medical schools. The new knowledge that has been acquired, and the new forms of technical procedure that

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have been elaborated, have revolutionized our ideas of the nature and causes of disease, have enormously extended our methods and conceptions of diagnosis, and have led to a truly astonishing advance in rational therapeutics. It is no wonder that the medical course has been lengthened, for the amount of clinical as well as of preclinical training that is considered desirable before graduation has steadily grown.

Now, obviously, the total length of time required for the medical student's training preliminary to graduation dare not be too greatly prolonged; moreover, during this limited time the student's brain has only a certain capacity for the acquisition of knowledge, for the understanding of principles, and for the learning of practical-technical methods of investigation. The questions that we, as medical educators, must ask ourselves, are: 1. What principles shall guide us in the construction of the preclinical and clinical curriculums? 2. What readjustments ought we now to make to bring our curriculums into accord with these principles?

A wise decision in the second matter will depend on finding a correct answer to the first question. That medical educators have given a vast deal of thought to these topics, every one knows. That, in general, sound principles have already been laid down, and the curriculums more or less adjusted to them, we may feel tolerably sure. But that considerable dissatisfaction both in the preclinical and the clinical branches still exists must also be freely admitted. And I believe that a thorough discussion of the subject such as we have entered on today is exceedingly timely. It will show us, I believe, that the discontent is due partly to disagreement regarding the principles that should guide us, and partly to failure to provide the conditions that conform to certain principles that all now accept.

We rejoice in the fact that there is no longer dissent from the view that, precedent to undertaking the more complex medical sciences of diagnosis and therapy, a considerable training in the preliminary natural sciences (physics, chemistry and biology), and education in the simpler medical sciences (anatomy, physiology, pharmacology and general pathology), are imperative. I speak of the "more complex medical sciences of diagnosis and therapy," for the time has passed when the work of the clinics could be regarded as something that is not scientific—as something merely practical or technical to be sharply distinguished from the "theoretical" or "scientific" work of the preclinical sciences. Workers in a modern medical or surgical clinic, or in the active clinic of a specialty, smile today when they read the addresses of well-meaning educators of a few years ago in which "medical science" was contrasted with "clinical medicine," or in which it was asserted that "the problems of clinical medicine differ from the problems of the laboratory," or that "a sharp break occurs at the middle of the four years' course when the student drops his science (sic) and turns eagerly to the clinic." A brief sojourn in one of our better clinics today should quickly disabuse the mind of any educator who harbors the illusion that such comments could still be justified. It is matter for congratulation that diagnosis and therapy now have connotations other than those implied even a decade ago. The clinical subjects, at least in our better medical schools, are now recognized as sciences differing from the simpler medical sciences chiefly in their complexity rather than in loftiness of ideals or in the methods by which they are cultivated. They, like the preclinical medical sciences, are now laboratory subjects also, only rather more so, since adequately to study a clinical problem there may be needed not only (1) a considerable knowledge of the preliminary natural sciences and of all the simpler intermediate (preclinical) medical sciences, but, in addition, (2) a knowledge of the clinical subject itself and (3) an ability to use in the inquiry any of the principles and technical methods of any one of the ancillary simpler sciences. Obviously, the requirements of the clinical problems tend to transcend the power of the single investigator, and there is an ever-increasing tendency to subdivision of the problems on the one hand, and, on the other, to group-cooperation in the larger investigations. Indeed, the expansion of the laboratories of the clinics is going on so rapidly, the opportunities for fruitful work in these laboratories are being so rapidly multiplied, and the problems themselves are being found so interesting and attractive, that even the more idealistic of our younger investigators are aggregating in the clinics, and there is real danger that, temporarily at least, the supply of investigators and teachers for the simpler preclinical sciences may be too much curtailed.

On turning over in my mind the differences of opinion that exist regarding the principles that should govern the arrangement of the preclinical curriculum, it seems to me that those that are outstanding are included in the following list:

1. Differences in opinion regarding the functions of the medical schools:

(*a*) Whether they shall be simply schools for imparting knowledge already acquired, or shall also be institutes for extending knowledge by original investigations.

(*b*) Whether their functions shall consist wholly in the training of future practitioners of medicine, or shall include also the training of men for other purposes.

2. Differences in opinion regarding the mode of teaching to be employed:

(*a*) Whether the teaching shall be conducted so that each science is taught for its own sake irrespective of its immediate bearing on the work of the clinical years, or so that the teaching of each science shall from the very beginning be strictly controlled and directed with exclusion of matter not of immediate utilitarian value for the clinics.

(*b*) Whether the teaching shall attempt chiefly the imparting of the facts of each preclinical science, and if so in how great detail; or chiefly the general principles of the science, illustrated by experiment, and combined with practical exercises by the student—exercises that will acquaint him, at first hand, with the methods of original inquiry and scientific experiment, in the hope of arousing and cultivating in him the scientific habit of mind.

Even a concise discussion of these several opinions would require an essay of considerable length. I shall give briefly my own impressions regarding some of these debatable questions, and I shall mention a few of the arguments in their favor that seem to me cogent. If I do not bring forward a larger mass of evidence now, it is partly because the time limit forbids, and partly in the hope that the very incompleteness of my treatment of the subjects may be an incitement to a lively general discussion.

Taking up the first point, I am still convinced that the medical schools should, as integral parts of universities, be scientific institutions in which teaching and original research shall both have a place. The advantages of this combination are so generally recognized that I need not labor the point. But the union of scientific productiveness with the teaching function has also its difficulties and its dangers, especially in the medical school. The professor, according to his special interest or ability, is apt to find one or other of the functions the more important and dignified; or, even with the best will in the world he may succeed in one and fail in the other function. Faculties should see to it that, in each department, the staff shall include both productive investigators and inspiring, well-balanced, well-trained teachers, even though to provide them may make necessary a multiplication of professors and assistants. The student, also, in such a combined department runs, it is true, some risk. Observing the prestige of research, and hearing an eminent teacher discuss enthusiastically some problem that he himself is attempting to solve, an ambitious student may attempt to undertake an extensive original investigation at the expense of his general education. But these dangers to both staff and students can, if they are known, be easily avoided, and in any case, they are in my opinion far outweighed by the benefits of the system.

It is a common saying, even of some of our most distinguished medical educators, that "the object of medical education is to make good doctors," and that "unless you can define a given course as bearing on that training, it has no place in the medical curriculum." Now every one will probably admit that the principal function of a medical school is to train good practicing physicians and surgeons. But I suspect that the overstatements which have been made on this point have been unconsciously defense-reactions against criticisms that the medical schools with higher standards are educating "professors" rather than "practitioners." Now, as a matter of fact, it is the duty of the medical school to make provision not only for the education of good doctors but also for the training of a certain number of men who shall not necessarily engage in practice but instead become occupied in teaching or investigating or both, either in the universities or in special institutes of research; for the teaching and investigating positions have to be ever refilled as they become vacant, and, besides, their total number is rapidly increasing. Since a younger generation must be trained to succeed the older in the preclinical as well as in the clinical sciences, it is the duty of the medical faculty to make its teaching of young men such that at least some of them shall be attracted to careers other than that of medical practice. Unless this is done, the medical sciences will languish, the students of the future will lack good teachers, and ultimately the doctors will be less good than they should be.

Perhaps the most actively disputed point on the list I have mentioned is that of the immediate utilitarian value for the clinics of the preclinical teaching. It has been matter of surprise to me to find that those who advocate teaching only the aspects of science that have a direct "bearing upon the future work of the medical man" are often professors of the preclinical medical sciences, and that opponents of this view are not uncommon in the clinics. Thus in the well-known discussion in England, in 1908, in which a chemist (Armstrong), a physicist (Dawson Turner), two physiologists (Starling and Sherrington), and several clinicians (Osler, Semon, Buist and Wells) participated, opinion among the preclinical scientists favored the teaching of the preclinical branches with the student's clinical curriculum ever in view, whereas the plea for the broad treatment of the preclinical subjects without too much regard to their immediate applicability in the clinics was voiced mainly by the clinicians.

In America, with the exception of some of the Canadian schools, the medical schools have insisted, and I believe with right, that the preliminary sciences of physics, chemistry and biology shall be taught in the departments of the general science faculty—not in the medical school. Now, just as it is better for anatomy, physiology and pathology to receive students whose training has been of a general character in physics, chemistry and biology, rather than of the special character denoted by "medical physics," "medical chemistry" and "medical biology," so in my opinion it is far better for the clinics to receive students who, in the first two years of the medical school, have been given a general training in the simpler (preclinical) medical sciences rather than a special training in a strictly "clinical anatomy," a "clinical physiology" and a "clinical pathology." My reasons for this conviction may be summarized as follows:

1. It is ultimately best for the student's clinical work if he come to the clinic with a good general grasp of each of the sciences ancillary to the sciences of diagnosis and therapy, and if he come familiar with the principles of each science as a whole and with the more typical of the technical methods of each science, irrespective of the immediate applicability of these principles and methods to diagnostic and therapeutic procedures. The body of facts that he brings with him, while not to be despised or ignored, is far less important than the true understanding of the science, the grasp of principles, the training in technic, the scientific habit of mind as applied in each science, and the capacity to make applications of any part of the science to new problems.

2. The problems of the preclinical medical sciences, while closely related to the problems of the clinical sciences, are by no means identical with them. The professor in the preclinical subject may be expected to know how to investigate the problems and teach the subject-matter and methods of his own branch; he cannot be expected to turn aside from these activities to engage in the problems of the clinics, nor is it probable that he will know the applications of his science now being made, or those likely to be made, in the clinics.

3. It is the business of the clinical sciences themselves to make the applications of the facts and methods of the sciences ancillary to them in the solution of their own problems. What would we think of a professor of physiology who expected that the professors of physics and chemistry should send the students to the physiologic courses already instructed in the applications of physics and chemistry to physiologic problems? It is just as absurd for a professor of medicine or surgery to expect that students entering the clinics shall bring with them a knowledge of the applications of physiology, anatomy, physiologic chemistry, pharmacology, general pathology and bacteriology to the sciences of diagnosis and therapy. It would be a great misfortune for the clinics and for the future of our doctors if the students spent

their time in the preclinical years in trying to acquire such knowledge. For they would then miss what is most important for them to acquire and what is essential for the advance of the clinical sciences, namely, the general training in the principles and methods of each preclinical science and the comprehensive grasp that will permit of application in any direction, in other words, of unlimited orderly growth.

4. The concern of the preclinical scientists regarding the applications in the clinic of the sciences they represent has, hitherto, been to a certain extent justified. For the clinics have failed to make adequate provision for the application of the principles and methods of the preclinical sciences in the clinical work. As a result, the preclinical scientists have felt that perhaps they should attempt themselves to teach the applications to medical students, or at any rate to teach only the facts of their sciences that they believe should be immediately applied. This course, if followed, would, in my opinion, be disastrous for both the preclinical sciences and the clinics. The remedy lies, I believe, rather in the radical reforms that have already been begun in the organization of the clinics and of the clinical teaching. The wasted opportunities for the teaching and the advance of the clinical sciences at hospitals have hitherto been deplorable. It is no longer sufficient to have merely wards and dispensaries with many patients for the teaching of diagnosis and therapy. It has become essential that, attached thereto, there shall be a group of clinical institutes provided with laboratories, with libraries, with suitable equipment, and with a large group of not overburdened teachers, that in these institutes the clinical sciences of diagnosis and therapy may be cultivated in the same intensive way as the other natural sciences. The main difference between one of the clinical institutes and one of the preclinical institutes will consist in the enormous extent of the field and the complexity of the problems of the clinic, the greater necessity for the division of labor and the multiplication of workers, and the necessity of providing in the clinical institute the men and the equipment necessary to insure that patients will be studied through application of the principles and methods of the whole series of preclinical sciences. In these clinical institutes the students should be drilled in the methods of physical diagnosis, chemical diagnosis, biologic diagnosis, applied anatomy, applied physiology, applied pharmacology, applied physiologic chemistry, applied pathologic histology and applied experimental pathology and applied bacteriology. This systematic training in the methods of the clinical sciences, though it should be conducted by the clinical teachers in the clinical institutes, should precede the clinical clerkships in the wards. It is desirable that the clinical clerks shall be an integral part of the working staff of the university hospitals, and that their training in methods shall have been sufficient to permit them to be used as reliable instruments of investigation of the patients in the clinic. The results of the examinations made by them may then, under adequate control, be incorporated in the regular clinical records of the hospital. Students who have received a good training of a general character in the preclinical sciences may, in the clinical institutes, be speedily trained to accuracy in the methods now useful in the clinical sciences. Students whose training in the ancillary sciences has from the beginning been special and with strictly utilitarian motives will be less likely to participate in making the new applications of science now constantly going on in the clinics, than students who have been bred in an atmosphere in which truth is sought for its own sake and irrespective of what the ultimate effect of its discovery may be.

From what I have said, you will have already surmised the opinion that I hold regarding the last on the list of mooted questions, namely, whether the learning of a body of facts in each preclinical science, or a general education in its principles together with acquisition of some of the typical technical methods of the science, is the more important for the student as far as his clinical studies are concerned. I have no hesitation whatever in saying that I regard both as important, though if I had to sacrifice one or the other, I should be more willing to give up the former than the latter. Billroth, who had very sound ideas on medical education, once said that "the sum of the contents of memory at any given moment is no measure of the capacity of a man; we forget much, but if we have had practice in a certain kind of thinking, it, like the ability to swim, will never be lost as long as we retain the full use of our mental powers." From physics, chemistry and biology on, through anatomy, physiology and pathology, all the way to the clinical sciences of diagnosis and therapy, the transition, both as regards content on the one hand and principles and methods on the other, is so smooth and gradual that the student has not only gained a thorough training in observation but has really secured the best possible foundation for the science and art of medicine. His growth is like that of a tree, and the tree is so well rooted that continuous growth may be expected for a long period. Our best textbooks quickly grow old, but the man whose education in the preliminary and intermediate sciences has been sufficiently general and not too special will be able to follow every scientific advance during his lifetime; he will educationally have done his best to protect himself from a premature senility.

After this discussion of principles, I may make a comment or two concerning readjustments of the curriculum that may now be needed. Here there seem to be two principal divergences of opinion:

1. Is the time now given to preparation in the preliminary natural sciences and to the simpler (preclinical) medical sciences in contrast with that given to the clinical sciences relatively too long or too short; and are the amounts of time assigned to any of the single preclinical sciences in contrast with that assigned to other sciences of this group disproportionately long or short?

2. Shall all the courses offered in the preclinical sciences be obligatory on every student, and shall they fill up his whole time; or shall the obligatory part of the curriculum be reduced to a minimum that will leave much (really) free time that may, at desire, be devoted either (*a*) to additional optional work in any or all of the subjects, or (*b*) to reading, reflection or recreation.

I myself do not see how we may safely assign less than one premedical year to the three preliminary natural sciences; indeed, while one year is perhaps satisfactory for physics and biology, it is not enough for chemistry, which in my opinion needs at least two years in addition to the work in physiologic and pathologic chemistry given later in the medical school.

As to the precise amounts of time to be devoted to the single preclinical medical sciences, I think they should vary somewhat with the degree of expansion that each science is manifesting at a given time. When

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the emphasis of a period is on morphologic studies, the corresponding subjects may well receive more attention; when, on the other hand, activity is more manifest in studies of function, there may be a modification of the curriculum to some extent in favor of the subjects that deal with function. A notable example of a wise dislocation in the curriculum is the lessened amount of time now given to materia medica since the necessity for a training in pharmacology has arisen.

I am inclined to believe that we could make a real advance in medical education if we reduced to a large extent the amount of time given to obligatory courses in all the preclinical and clinical subjects, and largely increased the amount of time that can be given to optional courses, to reading in libraries, to conversation, to reflection and to recreation. With good will on the part of the professors, with a better selection and organization of the general courses than is now prevalent, it would be possible, I believe, (1) to give an excellent general training in all the preclinical sciences, (2) to give opportunity for participation by each student in several optional courses on topics that particularly appeal to his interest, or that are especially suited to develop his talent, and (3) to leave some time, so sadly lacking now, for independent reading, for meditation, and for exercise in the open air—and this without extending the time now given to the preclinical work. I am sure there must be something wrong, however, with a disposition of the time and activities of medical students that sometimes results in a morbidity of 10 per cent. of a class from tuberculosis, even when on admission to the medical school, the members of the class have seemed, on physical examination, to be in good health.

In a few words, then, when considering the relation of the preclinical laboratory courses to the work of the clinical years, we should in my opinion assent to the following principles:

1. In each department, both teaching and original investigation should be represented.

2. It is the duty of the teachers of each subject to arrange the courses so as to give the most desirable training to men who are later to be medical practitioners, while at the same time providing for the education of some men that will not go into practice.

3. In developing the courses in the single preclinical sciences, regard for the direct utilitarian bearing of the subject on clinical work does not justify the teacher in neglecting the inculcation of the general principles of his science so that it may be understood as a harmonious whole, or the training in such technical methods as are necessary for the investigative work of the science for its own sake.

4. Whereas it is desirable that the student shall, on entering the work of the clinical years, bring with him a certain store of facts accumulated during his preclinical studies, it is even more important that he shall enter the clinic with his mind educated to observe accurately, to experiment in order to increase the accuracy of its observations, to sift critically, to think independently, to arrange facts in logical sequence, and to desire to act rationally—in other words, with a mind habituated to the methods of science. Finally, in making periodical readjustments of our curriculums, we shall need to vary the amount and kind of instruction in each clinical science in some degree according to the trend of the productiveness of the period, and we shall be wise, I believe, if we reduce the obligatory work in all subjects to the minimum consistent with an adequate general presentation of principles and technic, providing optional courses that may be taken by those that desire them, and leaving some time free for reading, for reflection and for open-air pleasures.

PRINCIPLES AND EXPERIMENTS IN MEDICAL EDUCATION *

JAMES EWING, M.D.
Professor of Physiology, Columbia University, College of Physicians and Surgeons
NEW YORK

James Russell Wallace once said in substance that the twentieth century added to human knowledge more than all its predecessors, but had done less than any other to make its knowledge available for human needs.

As the mother of the sciences and the chief instrument for the subordination of physical evil, this charge was laid chiefly at the door of medicine. It cannot be doubted that the charge was valid when Wallace made it, and probably today it remains virtually unanswered. There is, however, an obvious reason for this situation. The nineteenth century witnessed the gathering of practically all of the intimate and effective knowledge of physics and biology. During the period of the accumulation of this vast knowledge, it could hardly be expected that its practical application could keep pace with the rapid growth in so many directions. The great dilemma in medical activities today is the difficulty of maintaining a proper balance between the interests of pure science and research and the practical applications of medical knowledge.

A hasty retrospect will reveal how rapid the progress and how broad the expansion of medicine has been. Anatomy, the oldest of the medical sciences, entered the nineteenth century with considerable familiarity with the gross structure and even of the development of the human body, but histology and embryology experienced their modern growth in the latter half of this period. Huxley conceived the germ layer theory in 1860, Killiger systematized histology in 1870, and nuclear fusion in fertilization was not discovered by the Hertwigs until 1880. Apparently the most accessible and clearly definable domain in medical research anatomy in the last few decades has enjoyed an extensive and most significant transformation in becoming comparative and experimental. It has thus changed from a descriptive to an analytic science. Today in the several departments of gross human and comparative anatomy, histology, embryology and experimental morphology it easily maintains its place as the backbone of medical science.

Modern medicine is just about sixty-five years old. It began in 1853 when Virchow formulated the doctrine of cellular pathology. As late as 1833, Lobstein recast the ancient theory of the origin of cells from plastic lymph. In 1831, Schleiden discovered the vegetable cell; in 1833, Robert Brown described the cell nucleus; in 1838, Schwann identified the structure of plant and animal tissues; but not until 1849 did

* Read in a symposium on the "Relation of the Laboratory Courses to the Work of the Clinical Years," at the Twelfth Annual Conference of the Council on Medical Education of the American Medical Association, Chicago, Feb. 7, 1916; abstract of discussion, Society Proceedings, THE JOURNAL A. M. A., Feb. 19, 1916, p. 596.

Cruveilhier ventured finally to deny all validity to the blastema theory of tissue origin.

On the basis of cellular pathology, it became possible to formulate reasonably correct conceptions of what disease does in the body; and the vast additions to the knowledge of pathologic anatomy, and histology accumulated during the last sixty years, have gained for this subject universal recognition as the foundation stone of internal medicine. More than any other of the medical sciences, it separates medicine from the medical cults.

Guided by sound morphologic conceptions, physiology made rapid progress, beginning about the same period. In 1856, Claude Bernard's memoirs on the functions of the pancreas marked the beginning of experimental physiology. From a long line of famous contributors covering an ever widening field, we have today fairly accurate knowledge of the normal and disturbed functions of the body.

Chemistry long applied in a crude way to the problems of medicine became direct in its objects and fruitful in its results when its tasks were clearly set by pathology and physiology. Woehler connected the inorganic with the organic world by making urea synthetically in 1828. Liebig recognized the three classes of foodstuffs in 1846. Today the methods of organic and inorganic chemistry throw light on the intimate nature of physiologic processes, and this exact science has been of indispensable help in the development of pharmacology, bacteriology and general biology. In fact, the conceptions of vital processes tend more and more to be formulated in terms of chemistry, inorganic, organic, physical and physiologic.

Pasteur demolished the doctrine of spontaneous generation in 1861, and from his work dates the commencement of bacteriology and the germ theory of disease. Modern surgery is also its direct descendent. Through the methods of Robert Koch, we now know rather intimately the identity, life characters and mode of action of most of the bacterial causes of disease. As a direct outgrowth of bacteriology, there came into existence the science of immunology, in which the therapeutic triumphs of Behring and Roux in diphtheria were the first fruits. More recently, out of the study of immunity mechanisms has arisen the vigorous science of serology, which employs the methods of chemistry and physical chemistry over a wide range of problems, and has carried the elucidation of many phenomena of disease far more deeply than was possible or conceivable before its advent.

The first pharmacologic laboratory was established by Buchheim in 1856. Pharmacology may be said to have inherited the most difficult of all the labors of modern science. To cleanse the Augean stables of the accumulations of ancient medicines, to stem the ever increasing tide of empiric remedies, to wait on clinical medicine for its problems and on physiology and chemistry for its methods, have been some of the handicaps of this science, in spite of which its contributions form a sheet anchor for intelligent therapeutics.

Internal medicine has always had its own problems, and many of them antedate the cellular pathology; but few of its products of earlier date have escaped transformation at the hands of the modern sciences.

Clinical medicine has catalogued and superficially described the concrete problems of disease and turned them over for solution to the appropriate sciences. It receives in return the burden of applying the new knowledge as it is gained, and it has been overwhelmed by the task. It has had to resort to an elaborate subdivision of the field, and is now comprised of very numerous medical specialties covering different systems and organs, or even single diseases.

Legal medicine it has definitely set apart; but legal medicine thus orphaned has taken good care of itself, and through Taylor, Tidy, Maschka, Hoffman and a long line of notable students it has come to form one of the most effective, as also the most exact, of the applied branches of medicine. It is true that many American communities get along without any competent aid from modern forensic medicine, but only at the expense of public morality and safety.

Preventive medicine may be said almost to have outgrown its parent and certainly to have outstripped it in significant accomplishments. In effective form it is certainly a modern branch of applied medicine. In infectious diseases it was made possible by bacteriology, and in other fields it grew out of physiology and chemistry, and it employs all these sciences and engineering and other departments of physical science as well. It presents by far the broadest front of medicine, coming in contact with nearly all human interests and activities, and merging through the various departments of hygiene with criminology, sociology, political economy and the science of government. Its relation to military science and the general problem of national preparedness deserves especial mention at this time.

I am not attempting to sketch the history of medicine. I am merely calling the roll of the present existing departments of medical knowledge with a hasty glance at each for identification, and I am doing it for the purpose of expressing a point of view which would seem to be the logical one for the recognition of the principles of medical education. You may call it the laboratory point of view because it emphasizes certain subjects that are pursued chiefly in laboratories, but I prefer to call it the historical point of view.

It puts the care of the sick in a prominent position, but yet in a just relation to those other branches of knowledge which have made it possible to care for them at all and which offer a hope that we may sometime care for them better.

What has been the attitude of conservative medical educators during this period of sixty-five years? There is only one answer to this question. They have considered paramount the interests of medical progress. They have placed the highest value on all those influences which tend to support and develop the medical sciences. This position also has been maintained unassailed up to very recent years. During the period when the course of medical study occupied two or three years, 70 or 80 per cent. of the time was devoted to the fundamentals of medicine. Anatomy was by far the most prominent subject in the curriculum. The student saw little or nothing of practical medicine. In the last decade, with the addition of the fourth year, a systematic and comparatively successful effort has been made to enlarge the scope and improve the quality of clinical training, and some of the second, a large part of the third and nearly all of the fourth years are devoted to applied medicine and the actual practice of the medical calling. The result has been most beneficial. The student acquires as much or more theoretical knowledge than he had before, and he is able to apply that knowledge at the right time and in the right way at the bedside. I judge that the present medical

graduate is not open to the charge of Wallace that his particular knowledge is not available for practical needs. On the contrary, the clever student is so well equipped for practice that his services are usually in demand from the moment of graduation. He is by no means an experienced physician, he is not a competent surgeon; but he has delivered his half dozen obstetric cases, and in his hospital training he has watched the course, assisted in the diagnosis, applied the treatment, attended the necropsy, and listened to authoritative interpretations and discussions, in most of the common and many of the rare diseases that the general practitioner meets. Of the 4,000 hours of his medical course, he has devoted on a calculated average over 2,000 to these attainments.

This is genuine and effective clinical training, and its accomplishment has been the most conspicuous recent advance in medical education, at least in America. I think that laboratory men everywhere have witnessed this change with satisfaction and offered their hearty congratulations to their clinical colleagues.

Encouraged by the success of the new plan and impressed by the undoubted advantage of further extending the practical clinical training of medical students, it has been proposed to add to the required curriculum a fifth clinical year to be spent by the student as a junior intern in the service of an approved hospital.

I have elsewhere pointed out some objections to this plan. These objections seem to me serious and fundamental. They are briefly as follows:

1. It is a tactical mistake for university trustees to relinquish control of any essential part of medical education. It is an illogical step and a dangerous precedent to encourage state legislatures to dictate to university faculties how they shall conduct medical education, and it is unfortunate that any political influence should have been introduced into this matter.

2. It is an unsound educational principle to replace systematic instruction by members of a university faculty for training by hospital attending physicians with the routine material occurring in hospitals.

3. The average hospital is quite unsuited for medical education. Hospitals should first be standardized before students are by law forced into them.

4. The introduction of a fifth purely clinical year raises an additional bar against the choice of a career in scientific medicine.

5. The clinical year unbalances the curriculum by placing excessive emphasis on clinical training while subordinating the fundamental sciences and general medical knowledge. It turns out practitioners instead of educated physicians.

The aspect which the fifth year is beginning to take in some institutions of the highest grade meets some of these objections to its original form. It seems to be generally agreed that the year may safely be spent only in a hospital controlled by a medical school. In some notable cases the work of the year is systematically outlined and placed at least nominally under university officers. This plan is quite different from that of turning the student over to the hospital as a junior intern.

There are still further alterations in the plan of clinical training which virtually emasculate the scheme of pure clinical training. Thus Leland Stanford University requires a year in a hospital or in some other work. The qualifications of the hospital are specified, but the "other work" is not described, except that the student must write a thesis. The University of Chicago prescribes the conditions of the clinical work, and offers an option of research in any department of the medical school. Both of these plans relieve the harshness of the order that the student must enter a hospital if he wants to practice medicine.

On the other hand, the law of Pennsylvania, and that recently passed in New Jersey, flatly state that a year of service in a general hospital is required for the licensure to practice medicine.

Thus in regard to the very important matter of clinical training and the licensure to practice, there are at least three different conditions existing in prominent medical centers in this country. In the majority of eastern states the licensure to practice is granted on the recommendation of the medical school after four years of systematic training prescribed by the school. In some states the schools prescribe a fifth year either in a hospital under university auspices or in any approved advanced study. In a few states the student is required to enter a general hospital and serve as a junior intern.

The last scheme I can only regard as an injudicious experiment in medical education. For the sake of raising the average dexterity of the lowest grade of student, it ignores the claims of broad general education as a whole. It commits the state to the training of practitioners instead of the education of physicians. I am well aware of the gross incompetency of a large body of medical students in many sections of the country to practice medicine. For these the hospital year will be an advantage. It will not be wasted on any student, but it is a measure designed to deal with the lower strata of student society, and it is not the best available method of securing the desired results. It is open to all the objections which have been enumerated above. It will turn out smart young doctors well acquainted with the present vogue of endless clinical tests and methods they imperfectly understand, rather successful in practice, but, if possessed of intellectual honesty and personal ambition, ready to return to their alma mater after four or five years and beg the privilege of "brushing up." They are doing it now by hundreds, until the postgraduate instructors often outnumber the undergraduate students.

Fortunately there are indications that this scheme will not be adopted by many other states in which a reasonable circumspection precedes action in matters of such great importance.

The second plan of introducing a fifth year of advanced study in clinical or other fields is quite a different matter, and contains the elements of progress in the right direction. It may be assumed that five years of medical study are needed today for the education of physicians. This period has long been required in Europe, and its need has long been recognized in America. But when the fifth year is adopted, great care should be used in its disposal. From the historical point of view of the larger interests of medicine, I would venture to suggest certain considerations which may safely govern the disposition of this valuable time.

In the first place, it may well be asked if the fifth year may not permit the readjustment of the crowded curriculum of the first two years. Into this brief

period has been forced nearly all the theoretical training in the underlying medical sciences, as well as preliminary clinical work, so that few instructors feel satisfied that students now secure a real knowledge of these subjects. Speaking for pathology, I can say that the best present courses in this subject are on the whole elementary and abbreviated. Medical students do not adequately learn what disease does in the body. In most courses in pathology some important diseases are not even mentioned.

I am one of those who believe that a surgeon should know the natural history of the different forms of epidermoid cancer before he learns how to cut the cancers out, and that the physician should know the theories of the pathogenesis of rickets before he treats and advises such patients. The same standards of value apply to the instruction in other basic branches of pure and applied medical science. They need more time.

There are also several branches of science which are of great importance in modern practical medicine, are now presented imperfectly or not at all, and which may well receive due attention in a remodeled curriculum. Of these may be mentioned physical chemistry, medical physics, immunology, serology and chemical pathology. Such changes would meet some of the demands of the newer branches of knowledge on which the progress of medicine chiefly depends and with which the educated physician should be reasonably familiar.

In the latter half of the curriculum some specialization may be permitted toward the career the student may choose, but a broad education requires a thorough grounding in the principles of the theory and practice of medicine and surgery. Laboratory men are too often unfamiliar with the interests and problems of medicine, and their usefulness in medical faculties and in research is thereby curtailed. On the other hand, practitioners are hurried into practical exercises with a smattering of theoretical knowledge which they imperfectly apply ever afterward. The only comment I venture to make regarding present methods of undergraduate clinical training is to suggest that clinical clerkships are difficult to manage in a systematic course of instruction, and that there is danger of anticipating the work a hospital intern does under more favorable conditions. The main problem is the disposition of the fifth year, especially for that great majority which elects to practice medicine. In conversation with many colleagues I find a widespread feeling that this year should be made a year of university instruction and not a year of service in a hospital. Unless agreement on this principle can be reached, the fifth year becomes a matter of quite secondary interest to the medical educator. To follow a hospital attending physician about the wards and see what he does in his daily routine may enable the student to pick up many practical points, but it is not medical education. Nor will it suffice to exact a promise that the attending physicians will undertake the duty of giving adequate instruction to the interns. The attending physician is a busy man, and the best of his disquisitions on rounds are inferior to a systematic discussion prepared for the particular purpose of instructing advanced students.

The student can do much better by spending a year with carefully prepared clinical courses given by expert teachers in European hospitals, as many of our students have done. We must do at least as well as they if we are to hold our students and develop effective advanced clinical instruction. A corps of competent university instructors of the type of privat docents is needed to conduct this work. It should be one of their chief occupations, and an essential preliminary to their advancement to more prominent positions in the medical faculty. It has often been said that the training of students is much easier than the development of a faculty.

Should the work of the fifth year be conducted in a hospital? Certainly access to patients is necessary, and the observation of all the phenomena of disease that can be obtained will be of great value. Yet I believe the time thus spent should be limited and not devoted to routine history taking, colored photography, blood and urine examinations, and the keeping of records. The student should not be made a hospital servant, but should spend his time in the hospital in the presence of clinical material, in seminars on specific topics, prepared for him by his instructors. The hospital laboratory may develop his technical competency to a certain extent, and acquaint him with the principles, sources of error, and necessary limitations of laboratory diagnostic tests. He will then escape that implicit confidence which the average practitioner places in these mechanical methods of diagnosis.

The hospital morgue can offer him brief and significant insight into the effects of disease and the pathogenesis of symptoms. At the necropsy table he will learn some of the deficiencies of medical diagnosis and surgical procedure, and he will not grow up with personal conceit or a fancy for hero worship.

Rather than remain in a single hospital, the student should enjoy brief terms of instruction in several institutions, where he may obtain first hand knowledge of special fields, as pediatrics, contagious diseases, tuberculosis, cancer and insanity. Periods of three or four weeks spent in five or six such hospitals would give the general practitioner some real knowledge of the diseases which are chiefly to occupy him in practice, and which he cannot get by continuous residence in a single general hospital. The prospective surgeon might well replace the present initiation on the human patient by learning surgical technic on lower animals. His particular needs could be met by devoting special attention to the various subdepartments of surgery. To what extent specialization should be permitted in the fifth year I am not prepared to say, but think that in general we are inclined to exercise too minute supervision over the natural tendencies of well trained students.

So much opportunity for effective clinical training lies in these directions that it is difficult to find any defense of the scheme of turning the student over to the service of a hospital as junior intern.

I am a firm believer in the value of a comprehensive knowledge of disease, descriptive and theoretical, as obtained from medical literature, and I think the advanced student should spend all his evenings in the library. He should be required to search the literature for observations and interpretations of what he sees in the wards, and should report his results in good English. American medical literature is rapidly improving in quality and scope, but it will not reach its proper development until the better class of students are trained to activity in this field, and to develop a critical knowledge of good literature. It is said that

by far the largest circulation among medical periodicals in this country with one exception is enjoyed by certain semimedical journals whose standards of accuracy and possibly of ethics are questionable. Yet it is a principle of journalism not to create but to cater to the current tastes. Who is responsible for the taste for such literature. It is certainly the medical schools and possibly not always those of the lower class.

The production of an original thesis is included in all schemes of advanced clinical instruction. It should be made a genuine test of the student's ability in clinical observation and laboratory procedure, of his knowledge of literature, and of his ability to solve a problem, and should occupy quite as much of his time as his attendance in the hospital. It is hardly necessary to expand the point that unless the student has had some experience in solving a problem he will stand resourceless before the numerous clinical problems that confront him in practice. The young practitioner may be so fortunate as to have seen as a student just the same peculiar condition that confronts him in his first patient. Far more often he will have to depend on his general knowledge of disease, of medical sciences and how to apply them, and on his previous training in the solution of problems.

Finally, the fifth year may well give opportunity for the introduction of substantial courses in preventive medicine, hygiene, history of medicine, forensic medicine, and other fields in which medical knowledge comes into touch with the needs of modern society.

There is nothing new in the plan thus roughly outlined. It embodies the suggestions that have long been discussed and approved in many circles and have taken form as the needs in particular fields have become more concrete. It is based on the principle of the comprehensive education of physicians. It aims to provide the student with an effective body of practical information, with a genuine knowledge of the central medical sciences and with some competence in and sympathy for all branches of medical activity. It is not an intensely practical scheme. On the contrary, it frankly emphasizes theoretical scholarship. A natural deficiency of common sense it will not make good, and the mature judgment of the old practitioner will still be the reward of experience. Yet very few men will pass through five such years unfit to practice medicine.

I very much doubt if any body of practitioners with such theoretical training would fall into the blunder recently witnessed in one of our states of requiring by law a negative Wassermann test as a condition of marriage. Here is an excellent example of the difference between an educated physician and the practically overtrained man who falls a ready victim to medical absurdities.

An ideal surgeon was Frank Hartley, who could tell every pathologic condition occurring from the skin to the bone marrow in any part of the body. He knew these conditions in the literature and he knew them in the flesh. He was a scholarly surgical pathologist, like Billroth, and at the same time a master of surgical technic, while directing his operative ambitions chiefly to the mucous membranes.

An ideal physician was Francis Delafield, who first learned pathologic anatomy and learned it thoroughly by years of observation at the necropsy table, who interpreted his findings by a superb histologic technic, read clinical symptoms in terms of structural lesions, left his mark on the principles of general and the applications of special pathology, and then went out into practice and developed a systematized encyclopedic knowledge of the natural history of disease.

These men were exponents of a broadly conceived and faithfully executed educational plan, and they were some of its products.

We cannot do more and must not do less than bend our students in these directions, which are in accord with the best tendencies of the profession.

The historical development of medicine emphasizes the responsibility of medical education of today for the medical progress of tomorrow. On the roll-call of the present existing departments of medical knowledge, all must find a place.

A PROPOSED UNDERGRADUATE COURSE IN CLINICAL PHYSIOLOGY*

FREDERIC S. LEE, PH.D.
Dalton Professor of Physiology, Columbia University, College of Physicians and Surgeons
NEW YORK

It must, I think, be conceded that the average general practitioner of medicine knows far too little of the science of physiology, and has not the habit of looking at his patients from the physiologic point of view. He sees the normal man or woman hardly more than does the layman. The bodily condition that is before him in his professional life is a derangement, and it is the derangement that he has been taught to focus his interest on. When, too, he thinks of a deranged organ, it is the anatomic picture of it that is foremost in his mind, and not the deranged function. But his problem is really one of dynamics, not of statics, and the thought that should always be paramount, I contend, is that he is dealing with a derangement of a physiologic mechanism—a machine of inconceivable complexity has got out of order and it is his business to locate and determine the nature of the trouble and set the machine right. His problem all through is one that, when properly attacked, requires a keen knowledge of what the machine is capable of doing when in good order. Yet it is surprising to realize how little in detail the average general practitioner knows of this, and how little he analyzes his pathologic problems from the physiologic standpoint.

If this be conceded, how can it be remedied? Not, I think, by a change in existing courses in physiology. One of the obvious prominent features of the improvement that has taken place in medical education in the last quarter of a century is the reform in the teaching of physiology, and yet with all the professional physiologists, the physiologic laboratories and the required courses of practical work therein, the physiologic millennium, to which some of the most sanguine of us looked forward a quarter of a century ago, that state when the physiologic point of view will be paramount among clinicians has not yet come. Undoubtedly existing courses in physiology are capable of improvement. From the large mass of material constituting the science, a better selection of topics to be considered by the instructor and of experiments to be performed by the students may often be made. While maintain-

* Read in a symposium on the "Relation of the Laboratory Courses to the Work of the Clinical Years," at the Twelfth Annual Conference of the Council on Medical Education of the American Medical Association, Chicago, Feb. 7, 1916; abstract of discussion, Society Proceedings, THE JOURNAL A. M. A., Feb. 19, 1916, p. 596.

ing its firm and necessary basis on the principles of physics and chemistry, the subject-matter can often be made less esoteric, the bearings of a knowledge of the normal on an understanding of perturbed bodily processes can be emphasized, without the instructor's running the lamentable risk of giving a course in a narrow "medical" physiology. Yet improvement in existing courses cannot, I think, fundamentally improve the present situation, which is this: During either their first or their second year, or partly in one and partly in the other, the students receive their instruction in physiology. Most of them follow the course willingly because they have faith—faith in the wisdom of the men who have planned the course, and faith that in some way not now clearly comprehended, their training in it will be useful to them later. Nevertheless, too many students question the good judgment that imposes on them a difficult topic, the relation of which to the treatment of sick persons they do not understand. By the end of their second year they have completed their work in physiology, and lay the subject aside with a feeling of relief as they turn to the more congenial occupations of their two clinical years. Now they acquire a new vocabulary for which they have all the time been longing. Such terms as "sino-auricular node," "synapse," "refractory period," "amino-acid," "hormone," "action current," "vasomotor control" do not sound to them half so professional or thrilling as "arteriosclerosis," "pleural effusion," "uremic convulsions," "mitral stenosis," "syndrome," "cholecystitis" and "gastro-enterostomy." With the passing of the physiologic words go also their meanings, and throughout the rest of the school career, and too often the rest of professional life, physiology is merely a scientific curiosity. Many practitioners, on the other hand, come later to realize and to lament their lack of physiologic knowledge and to appreciate its illuminating point of view. This fact is indicated to me, not only by much professional testimony, but also by the success of such lecture courses as that of the Harvey Society of New York.

The abrupt termination of the prospective doctor's physiologic career at the end of his second year of study might be avoided if the clinical instructors of the two subsequent years were to see clearly the value of the physiologic point of view and keep it ever before their pupils. Here, too, there has been improvement in recent years, but progress is slow. I have, therefore, come gradually to the conclusion that for the present at least it is by the improvement neither of existing courses in physiology nor of existing courses in clinical medicine that the desired change in the attitude of practitioners can be brought about.

With the object of giving practitioners some opportunity to supplement their lack of school training, we established five years ago at the Columbia school of medicine a postgraduate course which we called "clinical physiology," and which consisted of informal lectures and demonstrations on the application of physiologic facts and principles and methods to problems in clinical medicine. Some of the topics considered in this course are as follows: the respiratory organs in normal and pathologic activity; the factors regulating blood pressure; blood pressure in man in its normal and pathologic relations; the physical features of the capillary blood flow and the early stages of hyperemia and inflammation; various cardiac lesions, their production and physical effects; the consideration of volumetric changes in the output of the heart as affected by various factors, together with an oncometer study of the kidney during these changes; renal secretion as affected by circulatory changes and the chemical conditions of the blood; the respiratory and vasomotor effects of abnormal intracranial pressure; the viscosity of the blood and its clinical relations; lymph, its normal flow and its relation to edema; the blood supply of the abdominal organs and their vasomotor reactions; the vasomotor reactions in their relation to shock; the general phenomena of spinal shock; the sounds of the heart and methods of recording them, and the action of the heart as studied by the electrocardiographic method.

We had hoped to attract to this course young medical graduates just out of their hospitals who, having had some clinical experience, might be glad, while waiting for patients, to return to the laboratory and broaden their knowledge of the physiologic relations of their clinical problems. Such young men, however, were conspicuous by their absence, and those who came to us were practitioners of ten, fifteen and twenty years' experience, men whose familiarity with clinical conditions had made them realize keenly how much an understanding of physiology would help them in their daily work. Each year since its establishment, from twelve to twenty such men have attended our course.

We believe, however, that a clinical experience of ten, fifteen or twenty years is not necessary to enforce this realization. We still believe that we can make an impression on the younger men. We recognize that it will be idle to attempt this during the first two years of medical study—some knowledge of clinical medicine is necessary. We are, therefore, now proposing that a course similar to our existing postgraduate course in clinical physiology be established for undergraduates. This should be given as late in the undergraduate period as is possible—either during the second half of the fourth year, or in the fifth year, if as now seems probable in Columbia, such a year shall be added to the curriculum. The chief instructor should be a professional physiologist who has had adequate clinical experience, and it is hoped that he would be a member of the regular staff of the university hospital, coequal with its chief physician, its chief surgeon and its chief pathologist. The various topics should be presented by means of informal lectures with demonstrations or, still better, by means of laboratory work by the students themselves. So far as it is possible, the subjects should be illustrated by experiments on animals, in which the various necessary lesions are produced, and also by the exhibition of human patients representing identical or allied conditions. The clear picture of the normal functional condition should always be kept before the student; the deviation from the normal should be depicted, and the methods should be shown that may be used in bringing about either a return to the normal or, if the lesion be incurable, a continuing tolerance toward it.

With such a program it is easy to jump to the conclusion that we are offering simply a course in experimental pathology, but this is not so. The pathologist is interested in a perturbation of function *per se*—to him the perturbation is the important phenomenon. To the physiologist it is only an incident in the patient's life, a change in a still more important phenomenon, which is the physiologic condition. The latter is the thing to keep always in mind. It is what the patient

has possessed before the perturbation began, and it is what he must regain. Our proposed undergraduate course aims to raise to its proper plane the conception of the normal, and to train the young doctor to look on it as the end for which he must strive.

In planning the course we at first thought that the men who would be most benefited by it are those who follow internal medicine, who are constantly brought face to face with functional problems. But in discussing our program with practitioners we have been impressed by the attitude toward it of the surgeons, especially the younger surgeons, who realize clearly that the modern surgeon, quite as much as the physician, needs the physiologic point of view, and who welcome any aid that will induce the prospective surgeon to see this more vividly. Moreover, if, as seems to be occurring, the field of preventive medicine is to be extended to include other than infectious diseases, and the medical practitioner of the future is to become more and more a hygienist, still more than at present must he possess an adequate knowledge of the physiologic state and ways to maintain it. Such a course as we propose not only would help thus to make better practitioners, but also would react, we think, on clinical teaching and assist in placing this more firmly on a physiologic basis.

We who have already come to realize the benefits that have been derived by practitioners from our existing course in clinical physiology thus believe firmly that in the present state of medical education it is only through some such medium that proper recognition will be given to the fact, which is emphasized not only by the physiologists but also by some of the keenest of clinicians, that an intimate acquaintance with physiology offers one of the most efficient preparations for successful medical practice.

OVERACTIVITY AS A POTENT FACTOR IN THE ETIOLOGY OF SOME NERVOUS DISEASES

INQUIRY OF 187 CASES

ALFRED GORDON, M.D.
PHILADELPHIA

Several years ago, having had an opportunity to observe a large series of individuals working in lead, a problem presented itself for solution. Some workers showed left handed wrist-drop, others right handed; another had a paretic condition of the long flexor of the right thumb; another had a double wrist drop; another had paresis of the right leg. In all these cases there was an absolutely identical etiologic factor, and still the functional disability did not manifest itself in the same portions of the body. In several professional pianists I have observed attacks of cramp-like sensations in the wrist, and in others in some of the fingers. The occupation and the continuous efforts being the same, the seats of the disorder are not identical.

In a large group of tabetic patients I had three cases of the cervical type in which ataxia began in the upper extremities. Why, therefore, is the functional disorder more marked in the arms than in the lower extremities when the specific infection is of a general character? In some of my tabetic patients the eye symptoms were conspicuous from the beginning. In others the leg symptoms were the first to appear and the eye disturbances appeared quite late in the course of the tabes. In some of my cases the involvement of the sphincters was a late manifestation, in others a very early one. These differences in the onset and localization of functional disability in various persons suffering from tabes dorsalis are striking and require an etiologic explanation, especially in view of the same syphilitic toxic agent in all cases of tabes.

Why is it that paresis is most frequent in persons who exercise their intellectual more than their physical functions? I had four patients with juvenile paresis in whom the symptoms made their appearance with their entrance into college, otherwise speaking, at the time of greater demands on intellectual efforts. What explanation can one find with regard to such an onset?

In a group of cases of progressive muscular atrophy of spinal origin, the affection began in the upper extremities in some patients, in the lower in others; in one limb in some cases and simultaneously in two symmetrical limbs in others.

The largest majority of my poliomyelitic cases were in children, in whom the affection was confined to the lower part of the body. In five adults the functional disability was observed in the one or both upper extremities. Three of these individuals were tailors and two were bricklayers. What is the reason of the difference in the localization of the pathologic process in the children and adults?

In three cases of pernicious anemia in men there were evidences of a degenerative state of the spinal cord. In one case of the same affection in a middle-aged woman the central nervous system was not in the least involved. If a toxin is supposed to be the cause of the pathologic process of the cord wherein lies the difference in the cases of the men and of the woman?

These few examples of my entire series, the details of which will be given later, are sufficient to demonstrate the *raison d'être* of my inquiry. Weigert and Roux long ago expressed the view "that normally there is a state of equilibrium among all cells of the body, and their interrelation is such that when one cell becomes diseased or otherwise disturbed, the energy of the cells which lie close to it develop an increased energy, namely proliferation and, per se, repress the affected cell still further. Weigert also calls attention to the fact that the process of functioning of a tissue is accomplished by its destruction, which in normal conditions is rapidly compensated by a proper supply of nutrition. But if the latter is not forthcoming the above mentioned equilibrium is disturbed and degeneration takes place. Edinger[1] went further and said that if, instead of, or with, a defective nutritive supply there is an excessive funtionating of a cell, the increased growth of the neighboring cells will lead to a degeneration of that overactive cell, which naturally is then less resistant. This is particularly seen when both elements are at work, namely, overactivity and nutritional deficiency.

Edinger succeeded in demonstrating by some experiments the rationality of his contention. By administering pyrodin to rats he produced in them a marked anemic condition resembling pernicious anemia of human beings. When this was accomplished, by certain contrivances, he made them perform a considerable muscular activity. The result was that all anemic rats showed at necropsy a degenerative state of the spinal cord. The control animals which after the injections

1. Edinger: Samml. klin. Vortr., 1894, No. 106.

of pyrodin remained at rest presented a total integrity of their spinal cords. It is therefore evident that overactivity or superfunction is a powerful predisposing factor in producing disease conditions in an individual whose organism is potentially under the influence of some toxic or otherwise abnormal element. Since function is apparently a potent agent in creating a syndrome of abnormal phenomena, it will be of interest to analyze closely a few of the disease processes of the nervous system from that particular standpoint.

In tabes, which is a syphilitic disease of the spinal cord, we have the organism of the individual possessing syphilitic toxins and consequently a disturbed metabolism. The great multiplicity of our sensory nerves which are peripherally situated and thus receive incessantly impressions and transmit stimuli, are constantly at work. They play a very important rôle in muscular contractions and in the awareness of position of muscles, of articulations and limbs. The overactivity of these peripheral sensory fibers and of their prolongations, namely, posterior roots and posterior columns in a subject whose nutrition is deficient because of a metabolism which is disturbed through the presence of a syphilitic poison, is bound to result in degeneration of the overfunctionating sensory tracts. Hence the very frequent if not constant presence of symptoms depending on the function of the sensory tracts, namely, loss of regulating power of muscular contractions and of display of joints, loss of reflexes, and anesthesias.

The constant involvement of the posterior roots and columns (sensory) finds its explanation in the functional overactivity of those neurons. Moreover, the loss of coordination in the legs is observed in individuals who use and overuse the legs; loss of coordination in the arms is met with precisely in cases of arm — or cervical — type of tabes. It is also commonly known that in individuals who lead a sedentary life and overuse their eyes, the leg symptoms are not pronounced, but the eye symptoms are conspicuous. On the other hand, when a tabetic becomes blind, he commences to lead a sedentary life, uses his legs very little and then we observe an improvement in the condition of the legs. When we turn our attention to the great frequency with which Argyll Robertson pupil is met with in tabes, and take into consideration the great and constant activity of the light reflex in all human beings, it is easy to conceive its exhaustion and its disappearance when the organism is under the influence of toxins such as syphilitic in tabes. The same remarks may be made with regard to the muscles supplied by the third cranial nerve. Ptosis, for example, is one of the most frequent symptoms of tabes. It is due to a paralysis of the levator palpebrae superioris, which is supplied by the oculomotor nerve. Its function is to keep the eye open and it is, therefore, a very active muscle.

The various manifestations of tabes have been presented here for a discussion as to their mode of development. It appears that the conception of "overactivity" or "exhaustion" gives an adequate explanation for their occurrence. But it must always be borne in mind that the "exhaustion" can be considered here only as a localizer, so to speak, of the morbid effect provoked by the presence in the organism of a toxin, syphilitic in the case of tabes, or else by the presence of other elements which are able to place the tissues of the body in a pathologic state. Let us now take up in detail the various affections of my series considered from the standpoint of exhaustion.

Occupation Neuroses.—There were 37 patients distributed as follows: 12 stenographers, 5 newspaper reporters, 3 violinists, 6 pianists and 11 shoemakers. All presented the characteristic neurasthenic manifestations. For many months without interruption they strenuously carried on their work. Moreover, they all appeared to be underfed. In the stenographers and reporters the localization and character of the disorder were not identical. Some of them had the paralytic form, namely, a sudden sensation of fatigue and numbness in the hand while writing. In others there was an actual cramp, namely, a sudden extension of the index finger and flexion of the thumb. In others a cramp appeared in the wrist, but not in the fingers. One of the three violinists developed a cramp in the right hand and the other 2 in the left hand. Of the 6 pianists, in 2 a sudden paretic condition would set in in the left wrist, the other 4 had a similar condition in the fingers of the right hand. Of the 11 shoemakers, 6 presented attacks of cramps in the biceps muscles of one or the other arm; the remaining 5 individuals had attacks of numbness in the thenar muscles of one or the other hand.

A close analysis of these thirty-seven cases convinced me that the occurrence of the neurosis in one particular segment or portion of a limb was due to a predominance of effort practiced by the affected region. Thus, the violinists who had attacks of cramps in the left hand happened to be left handed. The two pianists with the paretic attacks in the wrists were trained by teachers whose method consisted of holding the wrist stiff during the exercises.

Chronic Lead Intoxication.—The next group of cases in my series comprises 16 cases. Five of them had double wrist-drop. Two men had wrist-drop only on the right side, three men had wrist-drop on the left side. Two men, typesetters in a printing house, presented a paretic condition of the three first fingers on the right side. Three men were house painters who used a small size brush for their work. They presented wrist-drop on the right side. One individual was a supervisor in a white lead factory for ten years. He had to spend the entire day in the lead atmosphere. He developed a paresis of the right leg with a markedly diminished knee jerk and Achilles tendon reflex. All the patients of this group had general evidences of plumbism, namely, blue line, obstinate constipation, albuminuria, headache. An inquiry into the character of the work of the sixteen patients revealed the following: The individuals with double wrist-drop worked for a number of years in white lead factories where both arms were used with equal effort. The men with unilateral wrist-drop worked in lead colors and their work consisted of mixing the dyes, which they did with one or the other arm. Unilateral extensor palsies in plumbism are not a frequent occurrence. Nevertheless in the few cases which I studied from the standpoint of exhaustion, I found that the nature of employment coincided with the unilaterality of paralysis. The two typesetters, all right handed men, used in their work chiefly the thumb and the first two fingers continuously. Although the general symptoms of saturnism were present, nevertheless the local symptoms were conspicuous in those fingers which are most persistenly in use and therefore most readily fatigued. The three house painters being compelled to extend

their wrist thousands of times in succession, naturally developed a paralysis of the extensor muscles of the wrist. All being right handed, they presented a right sided wrist-drop. The supervisor of the lead factory who developed a paresis of the right leg had to watch

TABLE OF OCCUPATION NEUROSES

Number	Occupation	Form of Disorder	No. of Cases	Localization
12	Stenographers....	Paralytic.....	5	R. hand, 3; L. hand, 2
		Cramp.....	7	R. hand
5	Reporters.....	Cramp.....	3	R. wrist
		Cramp.....	2	R. thumb and index finger
3	Violinists.....	Cramp.....	1	R. hand
		Cramp.....	2	L. hand
6	Pianists.....	Paretic condition	2	L. wrist
		Paretic condition	4	R. hand
11	Shoemakers.....	Cramps.....	6	R. biceps, 4; L. biceps, 2
		Numbness.....	5	R. thenar, 3; L. thenar, 2
	CHRONIC PLUMBISM			
2	Typesetters.....	Paretic condition	2	R. three first fingers
3	Housepainters....	Wrist-drop.....	3	Right
1	Supervisor for 10 years in white lead factory	Paretic condition	1	R. leg (see text)
5	Laborers in white lead factory	Wrist-drop.....	5	Double
2	Mixers of lead colors	Wrist-drop.....	2	Right
3	Mixers of lead colors	Wrist-drop.....	3	Left
	PERNICIOUS ANEMIA			
2	Laborers.....	Ataxic paraplegia	2	Lower extremities
1	Collector.....	Ataxic paraplegia	1	Lower extremities
1	Housewife.....	No disturbance	1	
	POLIOMYELITIS			
5 adults	Tailors (3).....	Paralysis.....	3	R. upper and lower extremities, 1; both upper extremities, 1; R. arm and R. face, 1
	Bricklayers (2)....	Paralysis.....	2	R. arm and both lower extremities
10 child. (age 8-12)	.....	Paralysis.....	.....	R. arm and R. leg, 3; R. arm and both legs, 2; R. arm, 3; R. arm and L. leg, 2
15 child. (age 3-5)	.....	Paralysis.....	.....	Both lower limbs
	PROGRESSIVE MUSCULAR ATROPHY			
1	Policeman.	Atrophy.....	1	Onset in lower extremities
1	Watchman.....	Atrophy.....	1	Onset in lower extremities
2	Streetcleaners.....	Atrophy.....	2	R. upper limb
8	Laborers.....	Atrophy.....	8	Both hands
3	Tradesmen.....	Atrophy.....	3	Both hands
	PARESIS			
12	Teachers.....	Paresis.....	12	Mental sympt., Argyll Robertson pupil, 3d nerve palsy, 7
5	Cashier in bank...	Paresis.....	5	Mental sympt., Argyll Robertson pupil, 3d nerve palsy, optic neuritis
1	Politician.....	Paresis.....	1	Mental sympt., Argyll Robertson pupil, 3d nerve palsy
4	College boys.....	Paresis.....	4	Mental sympt., Argyll Robertson pupil, 3d nerve palsy
2	Jewelers.....	Taboparesis...	2	Mental sympt., Argyll Robertson pupil, optic atrophy
3	Bookkeepers.....	Taboparesis...	3	Mental sympt., Argyll Robertson pupil, optic atrophy
11	Clothing merchants	Taboparesis...	11	Mental sympt., Argyll Robertson pupil, 3d nerve palsy, optic neuritis

Number	Occupation	Form of Disorder	No. of Cases	Localization
	TABES DORSALIS			
6	Letter carriers....	Locomotor ataxia	6	Lower extremities, Argyll Robertson pupil
8	Policemen.....	Locomotor ataxia	8	Lower extremities, Argyll Robertson pupil
3	Messengers.....	Locomotor ataxia	3	Lower extremities, Argyll Robertson pupil
7	Icemen.....	Locomotor ataxia	7	Lower extremities, Argyll Robertson pupil
10	Laborers.....	Locomotor ataxia	10	Lower extremities, Argyll Robertson pupil
5	Motormen.....	Locomotor ataxia	5	Lower extremities, Argyll Robertson pupil
2	Stenographers....	Locomotor ataxia	2	Ataxia of upper extremities; loss of knee jerk; Argyll Robertson pupils
1	Laundress.....	Locomotor ataxia	1	Ataxia of upper extremities; loss of knee jerk; Argyll Robertson pupils
2	Electricians.....	Locomotor ataxia	2	Optic atrophy; loss of one knee jerk
2	Clerks.....	Locomotor ataxia	2	Optic atrophy; loss of both knee jerks
1	Cashier.....	Locomotor ataxia	1	Optic atrophy; loss of both knee jerks

over groups of men. In making his rounds he would stop at a certain group and remain in one sitting position for an hour at a time. While sitting he would place the right ankle on the left thigh and keep up that position during the entire hour. He repeated this position at each group of men whom he was obliged to inspect. This attitude was considered his habit, and he was never seen at the factory in another position. His wife corroborated this statement and said that that was also his sitting position in his home.

Poliomyelitis.—The poliomyelitic cases comprise a group of thirty, among whom there were five adults and the others were children. Of the former three were tailors and two bricklayers. One of the tailors had the right upper and lower limbs involved. Another tailor had both upper extremities at first stricken, but later the left arm recovered. The third had the right arm and right side of the face paralyzed. Evidently here the cervical cord as well as the medulla was affected. The two bricklayers had both their right arm and both lower extremities involved. The identity of the condition in both patients was striking. It is evident that the five adults whose chief exertion was manifest in the upper limbs had the cervical portion of the cord involved, as the ganglionic cells of this part of the central nervous system supplied nerve fibers to the brachial plexus, hence to the upper extremities. Of the twenty-five children, ten had, in addition to one or both lower limbs, also one or both arms involved. Inquiry revealed that they belonged to very poor families, and being from 8 to 12 years of age, they had to do considerable amount of manual work at home, such as scrubbing, cleaning, etc. Thus the involvement of the upper limbs can be readily conceived. On another page the usual occurrence of the poliomyelitic process in the lower extremities in children was mentioned. The reason of it lies in the great activity of the limbs, which are in a state of development in young children.

Progressive Muscular Atrophy.—In a group of fifteen cases of progressive muscular atrophy of spinal origin, the affection began in the lower extremities in

one policeman and in one watchman; in two Italian street cleaners in one upper limb. The remaining eleven cases showed an onset in both hands. The latter patients were all either laborers or tradesmen. The occurrence of the disorder in the lower limbs of the policeman and watchman speaks strongly in favor of the view in my thesis.

Pernicious Anemia.—There were four cases of pernicious anemia in my series. In the men, three in number, evidences of degeneration of the spinal cord were present. They presented symptoms of ataxic paraplegia, with diminished or absent knee jerks. Two of them were laborers and one a collector for an installment house. The fourth patient, a woman, housewife, presented no disturbances of locomotion and the knee jerks were normal. Here again we have a corresponding link between the degree of overactivity of certain portions of the body and an organic lesion of that part of the nervous system which controls the affected portions.

Paresis. — Out of thirty-nine paretics twenty belonged to the class of individuals who lead a purely intellectual life. Teachers presented the majority. In them the mental symptoms were the most conspicuous. With the exception of the eyes, other physical symptoms were very slight, namely, tremor of hands, slightly increased knee jerks and no toe phenomenon. Nineteen patients were tradesmen in whom the physical as well as mental symptoms were equally developed. They presented a condition called "tabo-paresis," namely, symptoms of tabes, together with mental disturbances found in general paralysis of the insane. If we consider the combination of physical and mental efforts displayed in the occupation of tradesmen, we must admit that the above observation as to the morbid manifestations in these individuals is of no little interest and is more than a mere coincidence. Four patients of the entire group had juvenile paresis. Their ages ranged from 16 to 20. The mental manifestations made their appearance at the time of their entrance into college. It is a period of intellectual life when application and mental efforts are tested at their utmost. It is also highly interesting to notice the variability of the eye condition in the paretics. Among the tradesmen there were two jewelers and three bookkeepers. It is remarkable that in every one of these men optic atrophy and Argyll Robertson pupils were very striking and developed early in the disease. In the persons who led a purely intellectual life there were twelve teachers. All presented pupillary symptoms and some also palsies of the third nerve. Five cashiers of banks showed besides third nerve palsies also evidences of eye-ground changes. The inference is consequently the same as in the cases of tradesmen from the standpoint of the principle of "exhaustion."

Tabes.—In considering the group of cases of tabes, 47 in number, the inquiry was made as to the character of occupation and the degree of exertion of the tabetics. The largest majority (thirty-nine) were individuals who did a great deal of standing or walking and carrying heavy weights. In this group there were letter carriers, policemen, messengers, icemen, laborers and motormen of street cars. The lower extremities alone were at first involved and the tabetic process began with disturbances of locomotion. Out of the remaining eight patients, three presented at first ataxia of the upper extremities and diminution of knee jerks, so that the diagnosis of cerebellar disease was originally entertained. Two of these patients were stenographers and the third, a woman, worked at a laundry. The stenographers' duties were particularly laborious and their hours were very long. They eventually developed leg symptoms.

In connection with the subject of tabetic ataxia in the extremities, it is well to recall what was said on the introductory pages with regard to the sensory neurons. The continuous and uninterrupted flow of impressions received by our peripheral sensory apparatus is the most important factor in all muscular contractions and in the display of our joints. Should the organism be invaded by a poison, such as syphilitic in tabes, the overfunctioning tissues or organs naturally will suffer first. Hence the disorder of locomotion and coordination, which so much depend on the function of the sensory neurons.

Proceeding further with the analysis of tabetic manifestations with reference to the principle of "exhaustion," the following is observed: Three patients who led a sedentary life worked in poorly lighted rooms; two of them, clerks in the same establishment, were assigned offices with windows opening in a very narrow and small yard, so that often they had to use gas light. The third had to use gas light all day. He was cashier in a small store and his desk was in the back part of the store. All three when first seen presented optic atrophy without ataxia, but with much diminished knee jerks. Two patients were electricians working in very brightly illuminated rooms and glaring light for ten hours daily. They also presented optic atrophy as an early tabetic manifestation. At the International Congress of Medicine held in 1913 the effect of very bright light was considered as injurious to the eye, owing probably to the presence of ultraviolet rays. The early occurrence of optic atrophy in the two electricians is undoubtedly due to this latter circumstance.

Thirty-two patients of my entire tabetic series presented ptosis in one or in both eyes and Argyll Robertson pupil in one or both eyes. If we consider the extraordinary activity and the incessant display of the light reflex from the moment we awake in the morning until we close our eyes for sleep — if, moreover, we consider the activity of the levator palpebrae which keeps the eye open — we cannot be surprised at the fatigue of these overactive functions in a body which is under the chronic influence of syphilitic toxemia, and the early and frequent occurrence of Argyll Robertson pupil and ptosis in cases of tabes is to be expected.

CONCLUSIONS

The present study, while it does not explain every morbid manifestation, nevertheless is sufficiently suggestive as to the effect of overfunction of organs on their early morbidity. It teaches that a body which is potentially diseased, or which is under the influence of a disordered metabolism through the presence of a toxic material, will develop morbid phenomena primarily in parts functionally exhausted. The "exhaustion view," as we have seen, is demonstrated quite satisfactorily in syphilitic affections of the nervous system, in alcoholism, in plumbism, in acute infectious diseases such as anterior poliomyelitis, in profound anemias and in other conditions accompanied by profound metabolic disturbances of any nature. It explains the constant and almost uniform and earliest involvement of those portions of the body that are kept in a state of fatigue.

This observation points to a very important feature in the domain of prophylaxy. Bearing in mind the pathologic potentiality in cases of chronic toxemias, early treatment of the latter, combined with removal from the usual occupation at the earliest possible moment, is apt to prevent localized morbid manifestations such as we have seen above with regard to locomotion and eye manifestations in tabes, or localized palsies in intoxications, for example. A potential syphilitic individual will thus be able to avert for a long period of time the early oncoming of morbid manifestations of syphilitic or parasyphilitic character in the domain of the nervous system. The principle of prevention is here strikingly evident. The recognition and adoption of the view of "exhaustion" in affections of functional and organic nervous diseases appears to be far reaching.

1812 Spruce Street.

CORPUS LUTEUM EXTRACT IN THE NAUSEA OF PREGNANCY

PRELIMINARY REPORT

JOHN COOKE HIRST, M.D.
Associate in Obstetrics, University of Pennsylvania, School of Medicine
PHILADELPHIA

My use of corpus luteum extract in the nausea of pregnancy is based on the presumption that there is more than a coincidence between the formation and disappearance of the corpus luteum of pregnancy and the cessation of the nausea. None of the theories based on the causative factor of fetal or syncytial toxins have worked well enough to encourage the hope that in them lies the solution of the problem. It is not unreasonable to suppose that there is sufficient absorption from the corpus luteum of pregnancy to account for the disappearance of the nausea, especially when one realizes that the nausea begins to diminish at the time the corpus luteum has reached its acme of development.

Acting on this idea, I have been administering, hypodermically, corpus luteum extract in doses of 1 c.c. (20 mg.) daily. This dose is in all probability too small, and will have to be increased materially, but this is a matter for investigation and will be fully dealt with in a subsequent and fuller report. The object of the present report is to call attention to the possibilities of the theory, in the hope that sufficient practical work will be done to determine whether or not it is of value.

So far, my experience with it has been encouraging. Five patients have been given the extract hypodermically and always intramuscularly, with the following results:

CASE 1.—Mrs. L., aged 27, in her third pregnancy, had severe nausea in this as in previous pregnancies. She was eight and one-half weeks pregnant, and was given four doses in all. She reported great relief after the first dose, and no nausea at all after the fourth. This in all probability was a neurotic vomiting, and as such is not a fair test. It should be discounted accordingly. I cannot believe that such rapid effect could result in the ordinary nausea of pregnancy.

CASE 2.—Mrs. R., aged 38, in the seventh week of her fourth pregnancy, had excessive nausea. In her three previous pregnancies, the nausea did not cease till after the fifth month. She had now had nausea for ten days. After nine doses the nausea was so relieved, though not entirely gone, that the patient described it as negligible and the treatment was stopped that further effects might be watched. The last dose was given two weeks ago, and there has not been any severe increase, though the patient is still slightly nauseated, but comfortable.

CASE 3.—Mrs. H., aged 24, had three pregnancies, all within three and one-half years. The patient was now twelve weeks pregnant, and the nausea was diminishing but still marked. She received eight doses in all and described herself as comfortable, with only occasional twinges of nausea. The last dose was given three weeks ago (the patient being now fifteen weeks pregnant), and there has been no return.

CASE 4.—Mrs. S., aged 24, nine weeks pregnant, in her first pregnancy, had nausea for one week severe enough to confine her to bed. She received four doses and was worse than ever. This case was a total failure. The patient has a large goiter, and possibly this is a factor in her case. Her nausea was controlled by lavage and large doses of bromid, but the corpus luteum showed absolutely no effect.

CASE 5.—Mrs. D., aged 30, now in her third pregnancy, had a hydatid mole removed in her first pregnancy at what would have been full term. In her second pregnancy, eighteen months later, another hydatid mole was removed at ten weeks. There was severe bleeding. In both these pregnancies the patient was excessively nauseated throughout, except for the last two months of the first one. She was now nine weeks pregnant, and had nausea severe enough to confine her to bed. She has so far received eighteen doses hypodermically. For ten doses she alternated between comfort and discomfort. Since the tenth dose she has had no nausea at all, and as yet no signs of degeneration of the ovum. Treatment is being continued on account of the possibility that it may have some effect in preventing a third hydatid mole. For more than a week it has been unnecessary, as far as the nausea is concerned.

These results (80 per cent. successful), in a very small number of cases, encourage me to persist until I can report a larger series. The one failure shows that it cannot always be depended on, but so far the results have been better than any other routine form of treatment, and in all probability, with increased doses, the method can be shown to have decided value.

1823 Pine Street.

DIPHTHERIA CARRIERS

J. C. GEIGER, M.D.
Assistant Director, Bureau of Communicable Diseases of the California State Board of Health
FRANK L. KELLY, M.D.
Bacteriologist
AND
VIOLET M. BATHGATE, M.S.
Bacteriologist
BERKELEY, CALIF.

THE NECESSITY OF TAKING NOSE CULTURES IN THE DETECTION OF DIPHTHERIA CARRIERS

During the month of October, 1915, cases of diphtheria occurred in six different schools in widely separated communities of California. Among the measures used to control the disease was the taking of cultures from all contacts and the subsequent isolation of all carriers. The proportion of infected to the non-infected contacts in such outbreaks of diphtheria has been subject to great variation, and while the uniform taking of nose cultures with those from the throat will not appreciably reduce this variation, it will reduce to a minimum the missing of carriers. A study of the comparative statistics in this article, in which the personal equation has been eliminated by three persons making the examinations with checking of results, and

only typical granular type of diphtheria bacilli being considered positive, proves absolutely that if we are to control epidemics of diphtheria by the isolation of carriers, nose cultures must always be taken with those from the throat.

The tables indicate the importance of taking cultures from both nose and throat in such investigations. It will be noticed that Investigations E and F, in which cultures were taken only from the throat, the percentages of positives are markedly lower than those of the investigations in which cultures were obtained from both nose and throat. The importance of nose cultures is conclusively demonstrated in the percentage average of positives, as nose cultures gave 42.2, compared with the percentage average of throat cultures, 7.9.

Inasmuch as only 28 per cent. of all positive cultures in these investigations were from the throat, one can readily see how many positives, 72 per cent., would not have been detected if nose cultures were not taken.

TABLE 1.—RESULTS OF CULTURES IN SCHOOL INVESTIGATIONS FOR DIPHTHERIA

Investigation	Total	Total Positive	Positive Nose	Positive Throat	Positive Nose and Negative Throat	Negative Nose and Positive Throat	Positive Nose and Positive Throat
A	132	28	25	10	18	3	7
B	65	24	21	8	16	3	5
C	17	15	14	1	14	1	0
D	55	22	18	6	16	4	2
E	101	6	..	6	..	..	..
F	99	5	..	5	..	..	..

TABLE 2.—TABLE OF PERCENTAGES OF INVESTIGATIONS IN TABLE 1*

Investigation	Percentage of Positives	Percentage of Positive Throat	Percentage of Positive Nose
A	21.2	7.6	18.9
B	36.9	12.3	32.3
C	88.2	5.8	82.3
D	40.0	10.9	34.6
E	5.9	5.9	....
F	5.0	5.0	....
Average total percentages	32.8	7.9	42.2

* Of all positives, 87.6 per cent. were found in cultures from nose; 28 per cent. of all positives were found in cultures from throat.

Another interesting observation is the total percentage average of positives, 32.8, the majority of which can be classed as diphtheria carriers. This large percentage is undoubtedly due to the fact that probably all the persons examined were recent contacts with diphtheria cases, as cases were present in the school examined.

THE USE OF THE SCHICK TEST IN DISTINGUISHING CONTACTS FROM CARRIERS

A point of great interest, in view of the rules of the California State Board of Health relative to contacts and carriers, was brought out in Group C of the preceding investigation. This group was composed of young adult students in a large university. In order to distinguish between the contacts and carriers, without waiting for the elapsing of the incubation period, it was decided to make use of the Schick test. With this test it was proved in forty-eight hours that the whole group was immune. The members of the group were accordingly classed as carriers, and so relieved of some of the inconveniences attending the quarantine of contacts. The results of the test were borne out by the fact that none of the carriers developed the disease. Another example of the value of the Schick test was shown in another investigation in which several carriers developed diphtheria, and in which the test was not used. Had the carriers in this group been given the Schick test as those in Group C, the nonimmunes would have been detected and could have been immunized before the development of the disease.

CULTURAL EXPERIMENTS WITH THE SPIROCHAETA PALLIDA DERIVED FROM THE PARETIC BRAIN

UDO J. WILE, A.B., M.D.
AND
PAUL HENRY DE KRUIF, B.S.
ANN ARBOR, MICH.

Recently,[1] one of us described the successful implantation of spirochetes and the transmission of experimental syphilis to rabbits from the living paretic brain.

At present this experimental syphilis has been transmitted to five generations of rabbits.

The initial inoculation of brain was made into the testis of a large rabbit, June 11, 1915, and thirty-two days later, July 11, large numbers of spirochetes were demonstrable in both testes by aspiration. August 12, about two months after the initial inoculation, the right testis was castrated under aseptic precautions, one portion being used for implantation into other animals, and the remaining portion for cultural experiments.

After thorough maceration with normal saline, the material was planted deep into tubes of rabbit kidney ascitic agar mediums. The cultures were covered with paraffin oil and cultivated under anaerobic conditions. Six tubes were inoculated from this material. Examination of the tubes about four weeks later showed no visible growth, but spirochetes in moderate numbers were found in the depth of the medium in two tubes. This series was allowed to incubate further, and November 6 the two positive tubes were found to have visible growth in which a pure culture was found. Secondary cultures were made from these two tubes. Three weeks later, Nov. 27, 1915, a fine growth was seen in the second subcultures, which microscopically proved to be a pure culture in each case. Third subcultures were made from the richest of these two tubes. Jan. 3, 1916, subculture 3 showed a pure culture of actively motile organisms.

At present, over four months have elapsed from the time of the initial inoculation, and the organism has been carried through three successful subcultures, at the end of which time these are as actively motile and as rich as at first.

The question of a neurotropic strain with certain morphologic characteristics, different from other spirochete strains, has been suggested by the work of Noguchi,[2] Nichols and Hough,[3] and others. Clinical evidence points suggestively to the existence of such a strain. In the organisms which we have isolated from

1. Wile, U. J.: Experimental Syphilis in the Rabbit Produced by the Brain Substance of the Living Paretic, Jour. Exper. Med., 1916, xxiii, 199.
2. Noguchi, H.: München. med. Wchnschr., 1913, lx, 2484.
3. Nichols, H. J., and Hough, W. H.: Positive Results Following the Inoculation of the Rabbit with Paretic Brain Substance, THE JOURNAL A. M. A., July 12, 1913, p. 120.

general paresis, there is no morphologic difference demonstrable. In the rabbit testis, numerous short thick forms with few spirals were found. In the cultures from this material, however, the predominating form was the typical fine spirochete with many convolutions, identical, in fact, with those seen in early cutaneous syphilids.

It is worthy of note, however, that although we had rich material to begin with, the cultures grew much more slowly and much less luxuriantly than do those cultivated from the early cutaneous or mucous membrane syphilids. On the other hand, it is to be noted that they are extremely viable. Examination at present of the original cultures, which have been disturbed by frequent examination and transplantation, still shows moderate numbers of organisms, actively motile and apparently as viable as when first seen.

SANITATION AND THE CONTROL OF PELLAGRA

CHARLES T. NESBITT, M.D.
Full-Time Health Officer, City of Wilmington and New Hanover County
WILMINGTON, N. C.

That the incidence of pellagra is not decreased by improved sanitation and general disease prevention methods, and that it is materially increased by business depression and increased prices of food, is the conclusion that must be drawn from the experience obtained in this city during the past five years.

The following tables show the improvement in health conditions which have been secured since 1911 through improved water supply, excreta disposal by means of sanitary sewers, the general sanitation of the city, incineration of all waste and refuse, strict laboratory control of milk and water supply and the infections that are subject to laboratory control, market and food inspection, improved drainage, medical school inspection, and the various other methods used for human conservation in modern public health work.

TABLE 1.—COMPARISON OF GENERAL DEATH RATES PER THOUSAND

Year	White	Black	Total
1911	19.94	34.78	29.43
1912	14.99	28.55	21.46
1913	13.30	24.94	19
1914	12.27	25.80	18.62
1915	11.1	22.8	16.4

TABLE 2.—COMPARISON OF DEATH RATES UNDER FIVE YEARS PER HUNDRED THOUSAND; COMPUTED ON ENTIRE POPULATION

Year	Rate
1911	1,123.03
1912	655.94
1913	651.24
1914	644.11
1915	474.2

TABLE 3.—COMPARISON OF DEATH RATES FROM ENTEROCOLITIS PER HUNDRED THOUSAND

Year	Rate
1911	411.64
1912	320.84
1913	206.72
1914	220.02
1915	80

TABLE 4.—COMPARISON OF DEATH RATES FROM TYPHOID PER HUNDRED THOUSAND

Year	Rate
1911	100.98
1912	35.64
1913	50.09
1914	25.5
1915	9.2

TABLE 5.—COMPARISON OF PERCENTAGE OF DEATHS FROM COMMUNICABLE DISEASES

Year	White Per Cent.	Black Per Cent.	Total Per Cent.
1911	50.34	54.42	54.16
1912	40.27	61.05	53.57
1913	34.76	45.40	41.47
1914	31.86	44.21	39.74
1915	22.39	32.59	30.20

The percentages in Table 5 are computed to show the relation between the total number of deaths and the number of deaths from all known communicable diseases, including pellagra.

While this improvement was continuous, as shown in these tables, the death rate from pellagra shows a marked increase in 1915 over 1912, 1913 and 1914. In Table 6 is given a comparison of the death rates from this disease for the past five years.

TABLE 6.—COMPARISON OF DEATH RATES FROM PELLAGRA PER HUNDRED THOUSAND

Year	Rate
1911	38.83
1912	21.38
1913	16.69
1914	38.26
1915	64.6

The years 1912 and 1913 were marked in this section by exceptional prosperity. The trucking industry and other industries of the county were very prosperous. The cotton market was active, and there was a marked increase in manufacturing and building activities. There was plenty of work for all, wages were good, and the prices of food were from 15 to 20 per cent. lower than they are now. With the outbreak of the war in the middle of 1914, there was an immediate depression, which has been more or less continuous though less marked at this time than up to June, 1915. The increase in the incidence of pellagra and the increase in the death rate of this disease follow this business depression very closely.

In the rural sections of New Hanover County a special intensive effort at sanitation began in July, 1914. The effort was concentrated on excreta disposal and water supply in order to control intestinal infections, which were especially prevalent. By the beginning of 1915 every rural home, black and white, in the county had been supplied with a privy at the owner's expense. At that time there were but twelve privies in the rural district which were not provided with receptacles and in which there was not a more or less successful effort at fly proofing. These conditions were maintained throughout 1915. Indeed, there was a marked improvement in this respect during 1915. In December, 1914, Prof. C. W. Stiles and Dr. L. L. Lumsden of the United States Public Health Service made a survey of the rural sections of this county with special reference to the methods of excreta disposal in use. A second survey was made in December, 1915, by Prof. C. W. Stiles of the United States Public Health Service and Dr. George M. Cooper, director of the Bureau of Rural Sanitation of the North Carolina State Board of Health. The last survey disclosed the fact that on the system of scoring used by the United States Public Health Service, the rural sanitary index in New Hanover County has been increased in a single year by 45 per cent. The rural population has been instructed in all disease prevention methods with the exception of pellagra, the means of preventing pellagra being only recently established. The incidence of this disease in the rural section as in the city has increased

during the past year. This incidence among the rural population from the cases reported shows three cases per thousand inhabitants, while in the city the incidence is a little more than one case per thousand. Our experience here teaches us that there are a great number of mild cases of this disease which are not reported and of which we have no knowledge, only those being reported in which the patients present themselves to physicians and hospitals for treatment. The numerical relation existing between the rural and city cases is, we believe, about that stated above.

In our local experience these conclusions seem to be justified:

1. There is no existing relation between soil pollution and the incidence of pellagra.

2. Close supervision of all cases, disinfection, fumigation, isolation and the other usual means of controlling infection have no influence on pellagra incidence.

3. Business depression, lack of employment, a limited market for products, and increased price of food, with consequent increase of indigence, increase the incidence of pellagra very definitely.

SYSTEMIC POISONING WITH BISMUTH *

WILLIAM H. HIGGINS, M.D.
Associate in Medicine, Medical College of Virginia
RICHMOND, VA.

Bismuth salts have been used for many years for diagnostic and therapeutic purposes, but their effects after absorption on the human system have received only scant attention. This is all the more remarkable in view of the fact that the other heavy metals have been the object of careful study in systemic poisoning, and are known to produce well recognized symptoms. Edsall has a very exhaustive article on metallic poisonings in Osler's "System of Medicine," but makes no reference to the toxicity of bismuth. The subject, however, has not been neglected so far as experimental work is concerned, as shown by the literature. As long ago as 1786, there were reports of vomiting, twitchings, dizziness and somnolence due to the ingestion of these salts. It was thought that these symptoms were due to impurities, particularly arsenic and lead, and it is possible that such was the case at that time.

In 1882 Kocher used bismuth subnitrate as a dusting powder on granulating surfaces. Although these wounds healed, rather severe constitutional symptoms followed the continued application in several cases. He observed a stomatitis progressing in some instances to ulcerations, diphtheritic gingivitis, dysphagia, nephritis, nausea and diarrhea. One of his patients died, and at necropsy large purplish spots were found scattered over the lining of the colon. Following his observations, others reported cases of similar type in which bismuth had been used for one cause or another.

Impressed by these reports, Steinfeld and Meyer, in 1884, undertook certain experiments in order to determine the toxicity of bismuth in animals. Their results showed that two forms of intoxication could be produced. The manifestations in the first or acute class were convulsions, dyspnea and bradycardia, with a fatal termination. In the second or chronic type, the animals showed marked lassitude, ulcerative stomatitis, anorexia, diarrhea, loss of weight and body heat, albuminuria, and sometimes tetanic contractions. The postmortem examinations in the latter class revealed ulceration and necrosis of the mucous membrane of the colon. Their explanation of this condition was that the bismuth circulating in the blood in a soluble form was precipitated by the hydrogen sulphid in the colon, and that the newly formed bismuth sulphid produced a necrosis by blocking the capillaries and lymph channels.

Other observers confirmed these experiments and showed that while bismuth subnitrate could be administered by mouth to dogs without untoward effects, very definite evidences of poisoning appeared after subcutaneous injections, producing the symptoms described by Steinfeld and Meyer. For example, one of Dalché's dogs received subcutaneous injections for twelve successive days. It died on the thirteenth day. Five days before death a brownish glistening line appeared on the gums of the anterior molars and on the mucous membrane of the inferior maxilla, and dark violet spots were seen on the mucosa of the left cheek. During the remaining days, similar lesions developed throughout the mouth, and at necropsy necrotic plaques were found on the lining membrane of the cheek.

Dalché's conclusions[1] were that the most striking feature of bismuth poisoning is the stomatitis. It is characterized by lesions of a brownish purplish color appearing on the tongue, buccal membrane and throat. It may remain stationary, but in the advanced cases the teeth are loosened, the gums become spongy, and there is a mild salivation. The breath has a fetid odor, and there is difficulty in swallowing. The lesion usually begins at the level of the molars and is most severe where the teeth come in contact with the mucous membrane. Generally these spots are covered by a whitish diphtheritic membrane surrounded by a blackish areola. Dalché believes that the stomatitis results from the elimination of the salt through the salivary glands, and may follow within a few days after the bismuth injection. Attention is called to the similarity of the stomatitis caused by lead, mercury and bismuth, lead being the least severe because it is not easily absorbed, except under certain conditions of peculiar susceptibility. Mercury stands midway between lead and bismuth. In view of the high atomic weights of these metals, Dalché suggested the possibility of all heavy metals producing similar lesions provided they are absorbed in sufficient quantity. Normally bismuth subnitrate is insoluble, but when it comes in contact with juices rich in albumin, changes occur, converting it into a soluble salt.

Dalché's experiments were repeated by other observers with *other* salts of bismuth, and similar results were obtained. Thus it was shown by the constancy of symptoms and lesions experimentally produced, despite the *variations* in salts, that the toxic effects are due to *metallic* bismuth. Up to the present year there have been forty-three reported cases of intoxication, thirteen of these fatal, following the local application of bismuth to granulating surfaces.

Quite distinct in symptomatology as well as in cause are those types of so-called acute intoxication follow-

* Read before Richmond Academy of Medicine and Surgery, Dec. 1, 1915.

1. Dalché, quoted by Mayer and Baehr: Surg., Gynec. and Obst., 1912, xv.

ing the *internal* administration of bismuth subnitrate. The great majority of these cases occur in children, and likewise in adults who have a definite inflammatory condition somewhere in the gastro-intestinal canal. Stimulated by the reports of several fatalities following the use of the subnitrate salt in the intestinal tract for diagnostic purposes, Boehme[2] threw considerable light on the subject by a series of experiments. He showed that bismuth subnitrate liberated nitrites whenever it was mixed with human stools, particularly those of children. By injection of this mixture into rabbit's intestine, nitrites could be demonstrated in the urine.

These animals presented a very definite clinical picture. There was noted in every instance an acute onset, dyspnea, and methemoglobinemia. As this syndrome closely resembled the condition following sodium nitrite poisoning, and was very dissimilar to the manifestation produced by bismuth applied locally, Boehme clearly established the relationship between the newly formed nitrites and the clinical results. Additional weight was given by a fatal case of bismuth subnitrate poisoning reported by Erich Meyer, who demonstrated nitrites in the urine, blood and pericardial fluid. Beck[3] believes that the intoxication occurs only when the production of the nitrites is greater than their elimination, which is chiefly by way of the kidneys. This conclusion, however, does not satisfy certain instances in which poisoning of the metallic type has followed the use of bismuth by mouth. In 1896 Kohn reported a case in which the administration of bismuth subnitrate in 5 grain doses, four times daily, produced the stomatitis and other lesions of pure bismuth absorption. Therefore, from these facts we are justified in assuming that while bismuth intoxication may occasionally arise following the use of the subnitrate salt internally, the great majority of such instances are due to the formation and subsequent absorption of nitrites from the large intestine. The records up to this year show that there have been twenty-one cases of poisoning with eleven fatalities from the employment of bismuth internally. Fortunately the subnitrate salt is very rarely used now by roentgenographers, and poisoning in this line of diagnosis is relatively infrequent.

My interest in this subject was aroused by a patient who presented himself for treatment in the medical department of the Medical College of Virginia Dispensary:

History.—Man, colored, aged 23, whose chief complaint was sore mouth, and whose family history was unimportant, had a negative previous history with the exception of a stab wound in his left lower chest, which was followed by pneumonia two months prior to his present illness. The hospital records show that at the expiration of the acute infection, his left pleural cavity was tapped and a large quantity of pus was evacuated. At this time 500 c.c. of bismuth subnitrate paste (33⅓ per cent. bismuth subnitrate and 66⅔ per cent. petrolatum) were introduced. Ten days later 750 c.c. of the paste were given. He had not been exposed to lead, nor had he been taking mercury in any form.

The patient stated that two weeks before, which was the date of the second injection of bismuth, he began to complain of sore places in his mouth. Starting on the tongue, three spots extended to the gums, cheeks and throat. He had had increasing difficulty in swallowing, and for several days he had been able to take only liquids in small amounts. He had persistent headache, dizziness on arising and marked weakness. His appetite had been very poor, with no nausea but extreme constipation. There had been no disturbance of vision or hearing.

Physical Examination.—The patient was poorly nourished, and flabby muscles showed loss of subcutaneous fat. The skin had a pasty sallow color. Eyes: The sclerae were pearly. The mucous membranes were rather pale. The pupils were equal and reacted normally. The ears and nose were negative. Mouth: The gums were somewhat cyanotic and definitely swollen. The jaws could be separated with difficulty, and as the tongue was protruded there was seen extending along each side a violet colored sloughing area covered by a sticky whitish diphtheritic membrane. This lesion measured 2 cm. in width at the base of the tongue and approximately 5 mm. at the tip. Its borders were well defined and practically continuous. Scattered over the buccal mucosa, there were a number of discrete as well as confluent spots of a similar character varying in size from a pea to the largest one, which occupied the entire portion of the right cheek from the first molar to the anterior pillar of the tonsil. On this side, the parotid gland was swollen and tender to pressure. Similar lesions were present under the tongue. In an unbroken line along the border of the gum adjacent to the teeth of both upper and lower maxillae, there was a heavy purplish blue deposit about 2 to 3 mm. in width. An identical picture was present along the inner borders of the teeth, though not to such an extreme degree. The gums were soft; the teeth were loose, and the salivation was so pronounced that the patient lay with his mouth over a basin to catch the continuous flow of saliva. His throat could not be examined. The glandular system was negative. The heart and lungs were clear with the exception of evidences of fluid in the left pleural cavity. The abdomen and extremities were negative. Hemoglobin was 80 per cent., leukocytes 14,000. The differential count was normal. Urinalysis revealed: specific gravity 1.020, a heavy cloud of albumin, a faint trace of sugar, many granular and hyaline casts, and a great excess of epithelial cells. After the patient's admission to the hospital, his urine became dark brown, and on standing showed a heavy black sediment. The total amount in twenty-four hours was 500 c.c. The patient's temperature varied from 90 to 110.

The Roentgen examination of the chest revealed a dense circumscribed shadow in the left pleural cavity. After the evacuation of the encapsulated bismuth by Dr. W. T. Graham, the distressing symptoms gradually subsided. Subsequent urinalyses indicated a rapid restoration of the kidneys, as shown by the disappearance of the albumin, sugar and casts.

When the patient was seen two months later, the ulcers in his mouth had entirely healed, but the steel blue lines along the borders of his teeth were still present. In order to exclude the possibility of systemic poisoning through contamination with one of the heavy metals occasionally found in the commercial bismuth, 5 liters of urine were evaporated to dryness, and the residue was tested for antimony, arsenic, lead and mercury. None was found, but bismuth was present in large quantities. I am indebted to Dr. Jacob Rosenbloom of Pittsburgh for these tedious analyses.

The profound influence of bismuth on the organs is well shown by a postmortem report of Mayer and Baehr,[4] who had the opportunity to study the condition of a patient dying six weeks after the injection of 3 ounces of Beck's paste. They found the kidneys showing the most intense parenchymatous change. The glomeruli were practically normal, but the epithelium in all the tubules was in an advanced stage of degeneration. Most of the tubules presented widely dilated lumina, filled with cellular débris and hyaline material. Throughout the organ the capillaries were intensely congested. The liver showed a mild cloudy swelling and some cellular disintegration. The small intestine was deeply injected, and contained areas of necrosis increasing in intensity as the ileocecal valve was approached. The mucosa from the pyloric ring to a

2. Boehme: München. med. Wchnschr., 1908, lv, 89.
3. Beck, Emil G.: Ann. Surg., February, 1914; Toxic Effects from Bismuth Subnitrate, THE JOURNAL A. M. A., Jan. 2, 1909, p. 14; Tr. Sixth Internat. Cong. Tuberc., 1908.
4. Mayer and Baehr: Surg., Gynec. and Obst., 1912, xv, 309.

point 15 cm. from the valve was stippled with a fine black pigmentation. The individual particles were visible only on close inspection, and at a distance gave the membrane a steel gray color. In the lower ileum the crypts over Peyer's patches were marked by coarser black granules. In the large intestine, they found the entire mucosa undergoing necrosis and covered by a greenish black diphtheritic membrane. The deeper portion was infiltrated with polymorphonuclear leukocytes. The rest of the submucosa was thickened and edematous. Microchemical tests showed the presence of bismuth in the liver, kidneys, spleen and intestine. The absence of methemoglobinemia and cyanosis and the gradual course of the disease eliminated the element of nitrite poisoning.

Although most observers state that bismuth is absorbed from granulating surface only after it has been converted into an albuminate, Mayer and Baehr, after demonstrating the metallic granules within the leukocytes, are disposed to believe that absorption is largely carried on by phagocytosis. These heavily laden cells were found in the muscular tissue at a considerable distance from the portal of entry. According to these writers, the excretion of bismuth is mainly through the kidneys and the gastro-intestinal tract, although others have demonstrated it in the bile, milk and saliva. The weight of evidence indicates that metallic bismuth poisoning results generally from the *local* application, whereas the toxic effects following the internal administration of the subnitrate salt result as a rule from the formation and absorption of nitrites.

Bismuth, therefore, is not the innocuous drug once described, but to some individuals may prove to be most dangerous. Sixty-five cases of poisoning with twenty-four fatalities should serve as a warning against its indiscriminate use. Even Beck admits that of the 1,100 cases treated by him, 30 per cent. showed pigmentation of the gums, thus indicating the absorption of the bismuth and its potentially toxic effects. We as medical men cannot refrain from noting with apprehension the unmistakable action of this agent on the kidneys and other organs in susceptible individuals. While we recognize the value of bismuth in diagnosis, we should not lose sight of its fate in the body after absorption. Although the actual number of cases of poisoning is not relatively large, yet there must be many instances of mild intoxication which have not been recognized. Realizing this selective action of the drug on the kidneys, it would seem that we are subjecting our nephritic patients to considerable hazard when any salt of bismuth is administered in large quantities internally or locally.[5]

8 West Franklin Street.

5. In addition to the references already given, the following will be found of interest:
Camerer: U. S. Naval Med. Bull., January, 1911.
Ely: Med. Rec., New York, January, 1912.
David, V. C., and Kauffman, J. R.: Bismuth Poisoning, THE JOURNAL A. M. A., March 27, 1909, p. 1035.
Pancoast: Univ. Pennsylvania Med. Bull., Aug. 12, 1906.
Warfield, Louis: Am. Jour. Med. Sc., November, 1913.

Chronic Organic Disease.—Public fear and public activity are easily excited by the mental picture (more or less accurate) of the horrific micro-organisms of epidemic disease, while the continuous ravage of chronic cardiovascular and renal diseases passes unnoticed. It is true that we now recognize micro-organisms as the principal and immediate cause of chronic organic disease, but this is not now known to the public and it is ignored if it is actually known by many physicians.—Eugene Lyman Fisk, M.D.

REPORT OF TWO CASES OF CARDIOVASCULAR DISEASE CAUSED BY STRICTURE OF THE URETHRA

N. P. YEARDLEY, M.D., PARKERSBURG, W. VA.

CASE 1.—*History.*—Man, aged 37, white, merchant, height 5 feet 11 inches, weight 150 pounds, with unimportant family history, has had the ordinary diseases of childhood. He contracted gonorrhea eighteen years ago, which ran a protracted course. He had a crop of venereal warts which were cut off. Twelve years ago, his legs swelled, and his arms and legs were cold all the time. He had great trouble keeping warm. Accompanying these symptoms, a white urethral discharge, tenderness in the right hypochondrium, and pains in the lower abdomen developed. He was disturbed at night by painful and tingling sensations in the right arm. While at work he suffered from paroxysms of pain of a dull boring character, located in the epigastrium. These continued at semimonthly and monthly intervals over a period of two years, when deep jaundice developed. Following one of these attacks, in 1911, he was taken to the hospital, and the gallbladder was opened and drained. The jaundice disappeared. Eight months after operation, he developed a constant, aggravating pain in the back in the lumbar region, which has remained since. Later sugar was found twice in the urine. He received two injections of salvarsan without benefit to the symptoms.

Symptoms.—Subjective: The patient complains of a constant dull pain in the right hypochondriac area. He is dizzy on exertion; when lying in bed or in the barber's chair he becomes dizzy when he turns on the right side; the arms and legs are always cold; he has constant pain in the back; he gets up at night three or four times to urinate; he has gas on the stomach and bowels, and is able to do but little work.

Objective: The patient is well developed and fairly well nourished. The temperature is normal; pulse 85, large, irregular, tension weak; respiration 18. The skin is very pale, the teeth decayed. The oral and nasal cavities and the lungs are normal. The heart is enlarged and the tones weak, and irregular on exertion. There is a scar over the gallbladder. There is tenderness over the right hypochondrium and epigastrium. The liver is impalpable. The intestines are distended with gas. The extremities are cold and moist, the nervous system normal. Examination of rectum reveals the prostate enlarged and nodular. In the urethra is found an extensive, soft, irritable stricture, with two points of stenosis involving the bulb and penile urethra. It admits a No. 16 French sound. When the stricture has been sufficiently dilated, the urethroscope shows the prostatic urethra and verumontanum intensely congested. In the urine are a few pus cells, but no sugar or albumin.

Treatment and Course.—The stricture disappeared gradually after the use of sounds for a period of six months. In the meantime the patient's digestion has become normal with a resultant gain in weight of 30 pounds; the complexion has become pink; the patient's strength has returned and the symptoms have disappeared, with the exception of the pain in the back and the nocturnal urination. These improve gradually under topical applications to the prostatic urethra and massage, and have now nearly disappeared.

CASE 2.—*History.*—Man, aged 29, white, porcelain worker, weight 145 pounds, height 5 feet 11½ inches, with unimportant family history, has had the ordinary diseases of childhood, was sick seven weeks with lead poisoning at the age of 21, and had gonorrhea three years ago. The present trouble started nineteen months ago with a marked case of icterus; in the morning he felt tired and worn out until he got "warmed up" by exercise; he had weak spells frequently; he slept poorly, and would waken from sleep with a start, "almost jump out of bed and be all a tremble." Ten months ago, he felt tingling and painful sensations in the legs and left arm, accompanied by a smothery sensation. He went to bed; he felt shaky all over; the attending physician found the liver and spleen enlarged. The patient was confined to bed four months and to the house six weeks.

Symptoms.—Subjective: At the present time the patient complains of dizziness, palpitation of the heart, of feeling very weak and of having a constant breathlessness. After resting for some time he feels an inability to use the extremities. He experiences tingling sensations and cramps in the muscles of the leg on walking. He suffers also from cold hands and feet, constipation and gas.

Objective: The temperature is normal; pulse 80, large, low tension, regular; artery thickened; respiration 15, audible. The skin is jaundiced, but otherwise negative. There is dilatation of the right temporal and superficial cervical veins. The mucous membranes are slightly pale, the conjunctivae jaundiced. The throat and nasal passages are negative. The supraclavicular and postcervical lymphatic glands are palpable; pulsation is seen at the jugulum. The thorax is long and flat, and is hyperresonant on percussion. The lung borders are at the seventh rib in front and at the eleventh articulation behind; vesicular breathing is diminished in intensity and roughened; expiration is prolonged. The apex beat of the heart is absent; the pulsation of the right ventricle is seen in the sixth and seventh interspaces near the left sternal line. The superficial cardiac dulness is increased downward and to the left. The heart is irregular at times, the pulse remaining constant; the tones are weak, and are heard best at the lower end of the sternum. Examination of the abdomen reveals epigastric pulsation; the liver is impalpable; the splenic boundaries are normal; there is tenderness on pressure over the epigastrium. The extremities are cold and clammy; the palpable blood vessel walls are thickened; the muscular tone is good.

The pupils react normally to light, accommodation and convergence. The deep reflexes are normal with the exception of the patellar, which is diminished. The peripheral nerves are normal. The prostate is enlarged, the right lobe hard. Examination of the urethra reveals extensive stricture, soft in consistency, occupying the bulb, scrotal and penile sections, extending to within 1 inch of the meatus, having three points of constriction. The caliber is No. 18 French. Albumin and sugar are absent from the urine; pus cells are present; there are no casts. The Wassermann test is negative.

Treatment and Course.—The stricture resolved readily under treatment with sounds. The patient has now been under treatment for two months; he has gained in strength and 10 pounds in weight; the jaundice has nearly disappeared; the pulse tension has improved; the pulsation of the right ventricle is no longer seen. In brief, the different manifestations have improved *pari passu* with the resolution of the morbid urethral process.

A CASE OF SYMMETRICAL GANGRENE OR RAYNAUD'S DISEASE ASSOCIATED WITH EPILEPSY

DAVID F. WEEKS, M.D., AND DAN S. RENNER, M.D.,
SKILLMAN, N. J.

J. T., aged 23, Italian, a well-nourished man, was admitted to the New Jersey State Village for Epileptics in October, 1912, suffering from epilepsy of the grand mal type, with seizures occurring both nocturnally and diurnally.

From his admission to the village to his admission to our hospital, Nov. 1, 1915, he had required no special medical or surgical attention except that in June, 1913, he was treated for a lime burn of his feet, and in July of the same year for ivy poisoning. From both of these conditions he made good recoveries.

Oct. 25, 1915, following a series of convulsions, he complained of pain in his left foot and ankle. Examination showed the temperature normal and the pulse slightly accelerated, but failed to reveal any reason for the pain. The patient was put to bed, and the ankle was painted with tincture of iodin.

Four days later considerable swelling of the ankle was noticed; there was no pitting on pressure; the pain still continued. Compresses of magnesium sulphate in saturated solution were applied without beneficial results.

October 30, the rectal temperature was 104 F. The foot was very painful to touch and manipulation. Magnesium sulphate compresses were continued, and 5 grains of sodium salicylate administered every four hours.

November 2, the patient was transferred to the hospital. Unguentum ichthyol, 25 per cent., dressings were applied, without benefit. The rectal temperature at this time was 103.8 F.

November 3, there was some bluish discoloration of the toes and dorsum of the foot, which continued until the 8th, when several punctures were made in the toes, following which they became pink, the swelling was somewhat reduced, and the foot became less painful.

November 10, the right foot and ankle showed some bluish discoloration. The skin of the dorsum of the left foot showed a tendency to slough. The left leg showed marked discoloration, extending to the junction of the lower and middle thirds. Three days later, while this foot was being dressed, the skin broke on the plantar surface and was removed. The skin slough continued until the central portion of the plantar surface was removed, with a portion of the skin covering the instep.

The discoloration progressed up both legs, covering equal and corresponding areas on each leg. The color was most pronounced on the left leg. There was at this time some maceration between the toes of the left foot. The toes of the right foot were beginning to atrophy; they showed the characteristic waxy appearance. About this time a few blebs filled with serum appeared on the inside of the right instep.

November 16, the patient showed marked toxic symptoms, and failed steadily throughout the day and night. The discoloration progressed up both legs.

On the morning of November 17, the course of the internal saphenous vein was distinctly outlined as a bluish green line over the lower third of the left leg. This discoloration had progressed to the middle third of the leg at the time of death, which occurred at 5 p. m.

The bluish discoloration had steadily progressed up both legs to the junction of the middle and upper thirds, covering corresponding areas on both legs a little higher on the inner than on the external surfaces, and somewhat darker on the left than on the right.

SUMMARY

The duration of the disease was twenty-three days when it terminated in death.

It was associated with epilepsy in a foreigner (Italian), among whom the disease is said to be most frequent and severe.

As far as we are able to learn, it is the first attack our patient ever had.

A blood examination made on the eighth day of the disease showed a leukocytosis of 10,000, and hemoglobin, 65 per cent.; the blood cells not counted.

From the available history, it was not the result of hereditary transmission.

Hyperesthesia to touch was a prominent symptom. Pitting on pressure was absent during the entire course of the disease.

The patient had five grand mal convulsions during this illness.

Mental Manifestations of Pellagra.—W. F. Lorenz in *Public Health Reports* thus sums up his conclusions after a study of the mental manifestations of pellagra: The psychosis that accompanies pellagra has the characteristics of the toxic psychoses in 90 per cent. of the uncomplicated cases admitted to an institution for the insane. It has great resemblance to the acute alcoholic psychoses. When pellagra develops in an individual already insane synchronously with the physical manifestation, a mental confusion or delirium may be added to the existing psychosis. Were an etiology to be suggested from the mental disturbances alone, the causes would fall among a group of agents similar to alcohol, in that they are not products of bacterial or parasitic invasion of the body, but chemical intoxicants in the narrower sense.

New Instruments and Suggestions

THE PREPARATION AND PRESERVATION OF COMPLEMENT

LOYD THOMPSON, PH.B., M.D., HOT SPRINGS, ARK.

Nearly all small serologic laboratories are confronted by the problem of securing guinea-pig serum for the Wassermann and other complement fixation tests. Where only a few tests are made at a time, and a pig is sacrificed each time for his blood, the expense often becomes greater than is justifiable. This may of course be partially overcome by bleeding the pig from the heart. Even so, considerable complement may be wasted, and another pig must be bled the next time tests are to be made.

Complement may be frozen and preserved at a low temperature (—15 C.) for several months, but most small laboratories are not equipped for such procedures.

Austin (THE JOURNAL, March 14, 1914, p. 868) advocated making a 40 per cent. dilution of the guinea-pig serum with 25 per cent. sodium chlorid solution. Then in his tests he used 0.6 per cent. salt solution instead of the usual 0.9 per cent., and states that by so doing he gets approximately 0.9 per cent. in his tubes.

In order to secure accuracy of dilution as well as to secure a suitable dilution for titration, the following technic has been devised by me and is now used in my laboratory:

An 8.1 per cent. sodium chlorid solution is prepared and autoclaved. Fresh guinea-pig serum is diluted with this solution 1:1, and sealed in small tubes, 2 c.c. to the tube. It will be seen that each tube contains 1 c.c. of pure guinea-pig serum containing (supposedly) 0.9 per cent. of sodium chlorid, or 0.081 gm. The entire sodium chlorid content of each tube is 0.09 gm., corresponding to the quantity each 10 c.c. of normal salt solution should contain.

Therefore, in order to make a solution containing 0.9 per cent. sodium chlorid, it is necessary only to add 8 c.c. of distilled water to the contents of each tube, and we have a 1:10 dilution of guinea-pig serum.

This is titrated before each test, and the unit usually used in my laboratory is 0.5 c.c. Allowing 3 c.c. for titration, it will be seen that each tube of "salted" serum will make enough of the diluted complement for the titration and for fourteen tubes, that is, enough for five tests and positive and negative controls.

It is the custom in my laboratory to bleed from the heart three good sized guinea-pigs at one time, securing from 20 to 30 c.c. of blood, which yields from 10 to 15 c.c. of pure serum, and lasts from ten days to two weeks, depending on the number of tests being made. While the complement is usually not kept longer than two weeks, some six weeks old has been used, and was apparently as active as ever.

A NEW CAVITY SIGN IN PULMONARY TUBERCULOSIS

F. W. WITTICH, A.M., M.D., POKEGAMA, MINN.
Superintendent, Pokegama Sanatorium

Last September, while I was examining a patient with chronic advanced pulmonary tuberculosis with a fair-sized cavity, the stethoscope was placed over the cavity when the patient swallowed. I was startled at the loudness as well as the character of the sounds elicited. A series of coarse crackles was heard that seemed directly beneath the bell of the stethoscope.

It frequently happens that in the course of routine examinations of the phthisical chest when the patient is instructed to breathe out, cough and breathe in, he will at the end of inspiration unconsciously and involuntarily swallow, so that the normal reflex of deglutition is heard and familiarized. It sometimes happens that the normal sounds produced in the chest by swallowing follow so closely the fine posttussic crepitations characteristic of tuberculous involvement that the two seem blended, misleading an inexperienced auscultator unless he has noticed the patient's swallowing.

After the abnormal sounds were heard in the case mentioned above, the stethoscope was transferred to a portion of the lung supposed to be fairly unaffected, and the ordinary swallowing sound seemed distant and muffled in comparison. When the stethoscope was returned to the cavity area, the former sounds were again produced. The area of abnormal sounds corresponded fairly accurately to that of increased vocal resonance, bronchial breathing, and whispering breath sounds.

In the belief that the sign might be of some value in confirming one's diagnosis in doubtful cases of excavation, it was used whenever possible as a routine measure in chest examinations. Very seldom did the sign fail to be obtained in greater or less degree where the other physical signs of cavity were present. Except as a confirmatory sign, it did not seem to be of special value until a case came up in which the signs of slight excavation were doubtful. The swallow sound was strikingly present only over the area questioned, and a diagnosis of cavity was made which was later confirmed when the excavation became more extensive and there was no doubt as to its existence.

The normal act of swallowing produces a uniform sound in most persons. It is caused by the tongue, the contraction of the muscles of the pillars of the fauces, and the elevation of the larynx, particularly the contraction of the mylohyoid muscle in the floor of the mouth, which was shown by Kronecker and Meltzer (*Arch. f. Physiol.*, 1883, suppl. vol., p. 328; *Jour. Exper. Med.*, 1897, ii, 453) to be the most important factor in shooting food suddenly through the pharynx into the esophagus. A second or minor sound is apparently caused by the peristaltic movement of the musculature of the esophagus. The sound is of most value when water is not swallowed, as there is usually a dry squeak produced when nothing is swallowed that is of sufficient intensity to be auscultated.

There is no claim of originality in the observance of the sign. It is merely suggested because I have not seen any statement of its having been used before. If found by other observers to be of any diagnostic value it merits further trial.

TOWEL HOOK

R. M. HARBIN, A.B., M.D., ROME, GA.
Fellow of the American College of Surgeons

Advantages of these towel hooks are:

1. They furnish a ready means for constructing a coffer dam that will prevent skin contact of viscera. If the edges of the incised skin are transfixed through the middle section

Towel hook (actual size).

of a towel, folding the towel back will conceal the hooks throughout the operation.

2. Having short handles, these hooks do not require to be removed when the whole hand is introduced into the incision, and they will not interfere with the use of the retractors, or traumatize the skin.

3. They are inexpensive. Eight or ten would be required for an ordinary incision, and they may be strung on a long piece of tape.

4. The shoulder *S* prevents the towel from receding from the edge of the skin, and the size of these hooks may be increased somewhat for a long incision.

Scope of Physician's Activities.—Every physician should act in the capacity of a teacher, preacher and health superintendent.—John W. Drake, *Jour. Oklahoma State Med. Assn.*, February, 1916.

Therapeutics

AMEBIC DYSENTERY

The value of ipecac in the treatment of bowel infections with the endameba has long been known, as has also the disagreeableness of the treatment. A. Rogers' assertion,[1] in 1912, that the soluble salt of emetin, the active principle of ipecac, could be given hypodermically to cure amebic dysentery, was welcome. The truth of this assertion has now become generally established, and the points for discussion are the best method and the best dose, and the prevention of recurrences of the disease.

Vedder[2] recently discussed the present status of the treatment of this disease, and Lyons[3] answers some of the suggested questions. Lyons finds that emetin will probably not act locally in the intestines, but must be absorbed to act, and hence kills endamebas only in the tissue. When they are killed, the lesions heal. Emetin is irritant to the stomach and intestines, and causes vomiting and diarrhea when given by the mouth, unless in small doses. It will cause diarrhea if given too long by the mouth or subcutaneously, and the best method to give it is subcutaneously. Intramuscularly it is too irritant, and intravenously too dangerous. In the colon it is more irritant and no more efficient as a bactericide than some other antiseptic, a silver salt, for instance. The soluble hydrochlorid is slightly acid, and even in small doses subcutaneously will cause pain and some considerable local irritation; but if the dose is small, this inflammation is not serious, and the induration is not great.

Lyons finds that the best dose in an average case of endamebic dysentery is for an adult one-third grain of emetin hydrochlorid three times a day, given hypodermically, and this dose should be continued from one to two weeks, or at least four days after the stools became formed. When it is given for longer than two weeks, a diarrhea is liable to be caused by the emetin.

Previous to the emetin treatment, Lyons gives a saline cathartic, and castor oil or a saline occasionally throughout the treatment. This not only washes out the dead endamebas, but may also cause the encapsulated germs to change their form into one that the emetin can attack. It is these encapsulated endamebas which cannot be killed by the emetin that often cause recurrences.

Permanently to eradicate the disease he advises giving a second series of emetin injections two weeks after the first, and a third short series after three weeks more, and, if there has been a recurrence, even a fourth series later.

The only undesired effects of emetin injections in the dose recommended, besides the local irritation, are vomiting and diarrhea. Large doses have caused peripheral neuritis, purpuric eruptions and edema. Emetin may, of course, be given by the mouth if there is a serious objection to hypodermic administration, but it is ordinarily inadvisable.

Twenty-five per cent. of Lyons' cases were recurrences; hence the necessity for repeated bacteriologic examination of the feces, and the wisdom of the intermittent treatment advised.

Not every patient who shows endamebas in the stools is ill. Some become tolerant, and are then carriers. Emetin is not very successful in these cases. Vedder suggests colon washing with quinin or silver solutions.

Barlow[4] reports a study of endameba dysentery in Honduras. He examined forty cases from eight to fourteen months after cessation of treatment, and found that 80 per cent. of the patients did not have a relapse for seven or more months, if they were treated for ten days continuously by not less than 1 grain of emetin per day. A shorter number of days of treatment allowed relapses, and a combination of the emetin treatment with ipecac by the mouth did not prevent such relapses. He found it preferable to give the emetin once a day in 1 grain doses.

Ravaut and Krolunitski[5] found the endamebas in the dysenteric stools of some French soldiers in northern France. In these cases they did not find emetin injections very satisfactory. They did, however, have success with the administration of salvarsan intravenously.

1. Rogers, A.: Brit. Med. Jour., June 22, 1912, p. 1424.
2. Vedder, E. B.: Origin and Present Status of the Emetin Treatment of Amebic Dysentery, THE JOURNAL A. M. A., Feb. 14, 1914, p. 501.
3. Lyons: Am. Jour. Med. Sc., July, 1915, p. 97.
4. Barlow: New York Med. Jour., Oct. 23, 1915.
5. Ravaut and Krolunitski: Bull. et mém. Soc. méd. d. hôp. de Paris, Oct. 21, 1915.

New and Nonofficial Remedies

THE FOLLOWING ADDITIONAL ARTICLES HAVE BEEN ACCEPTED BY THE COUNCIL ON PHARMACY AND CHEMISTRY OF THE AMERICAN MEDICAL ASSOCIATION. THEIR ACCEPTANCE HAS BEEN BASED LARGELY ON EVIDENCE SUPPLIED BY THE MANUFACTURER OR HIS AGENT AND IN PART ON INVESTIGATION MADE BY OR UNDER THE DIRECTION OF THE COUNCIL. CRITICISMS AND CORRECTIONS ARE ASKED FOR TO AID IN THE REVISION OF THE MATTER BEFORE PUBLICATION IN THE BOOK "NEW AND NONOFFICIAL REMEDIES."

THE COUNCIL DESIRES PHYSICIANS TO UNDERSTAND THAT THE ACCEPTANCE OF AN ARTICLE DOES NOT NECESSARILY MEAN A RECOMMENDATION, BUT THAT, SO FAR AS KNOWN, IT COMPLIES WITH THE RULES ADOPTED BY THE COUNCIL.

W. A. PUCKNER, SECRETARY.

LYSTERS PREPARED CASEIN DIABETIC FLOUR.—Milk casein to which has been added a leavening mixture consisting of sodium bicarbonate and potassium bitartrate and also some sodium chloride, and saccharine 0.057 Gm. per 100 Gm.

Actions and Uses.—This flour is employed in cases in which carbohydrates are contraindicated, such as diabetes, etc.

The nutritive value of 500 Gm. of Lysters prepared casein diabetic flour corresponds to approximately 2,195 calories, of which 2,030 calories are due to protein and 165 calories are due to fat.

The same quantity of milk represents 360 calories, of which 84 are due to protein and 177.6 to fat.

Dosage.—Lysters prepared casein diabetic flour is said to be adapted for the preparation of muffins. Of these three to six may be consumed daily.

Manufactured by Lyster Brothers, Andover, Mass. No U. S. patent or trademark.

ANTISTREPTOCOCCUS SERUM (See N. N. R., 1916, p. 302).

E. R. Squibb & Sons, New York.

Antistreptococcus Serum Rheumaticus.—Produced from strains of streptococcus from the joints and blood of cases of rheumatism. Intended for use in acute articular rheumatism. Dosage, from 20 to 50 Cc., repeated in twenty-four hours, and again if necessary; administered intravenously, or subcutaneously if intravenous administration is impracticable.

THE JOURNAL OF THE AMERICAN MEDICAL ASSOCIATION

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SATURDAY, FEBRUARY 26, 1916

THE EXERCISE OF WALKING AND RUNNING

A familiar furniture advertisement reminds us that, inasmuch as one third of our life is spent in bed, we can well afford to give some consideration to the attainment of comfort during that period. It is equally true that another large fraction of our daily experience consists in walking. Even a seemingly sedentary person indulges in the movement of forward progression to an extent which he may scarcely realize. According to F. G. Benedict, very few persons close a day of ordinary life without having walked a distance of not less than two or three kilometers (between one and two miles), and the actually studied movements of a person who might be classed as an ordinary "office worker" showed that the average distance walked per day amounted to seven miles.[1] If we add to such facts the consideration that walking is a part of the necessary business routine of large groups of persons, it is surely commendable to make inquiries into the physiologic aspects of this form of exercise or bodily movement. An elaborate study of the subject has lately been completed in the Boston Nutrition Laboratory of the Carnegie Institution of Washington.[2]

Theoretically, in moving the mass of the individual in a horizontal direction, no special work should be required of the human body as a machine beyond that for overcoming the resistance of the air. As a matter of fact, however, it is pointed out that when a person is walking, not only is energy required for the external muscular exercise, but also a heat production is necessary for the entire maintenance of the body activities, including muscular tonus, the work of circulation, respiratory muscles, and the external work of balancing the body in an upright position, none of these activities contributing directly to the work required to move the body in a horizontal direction. The energy expenditure of the body in walking thus becomes a complex made up of numerous contributions for special incidental purposes. The mechanical processes incidental to walking, even at a moderate pace, usually involve some extraneous muscular movements apparently not directly connected with the motion of forward progression, such as the more or less vigorous swinging of the arms and a not inconsiderable raising of the body weight with each step. Since these extraneous muscular movements do not necessarily have an effective value in transporting the body weight or the superimposed load in a horizontal direction, the problem of finding the calorie requirement for such transportation of weight becomes an exceedingly complicated one.

Some of these items which have been ascertained experimentally in the Boston laboratory are little short of surprising. Thus it was found that when the arms are swung vigorously, as so commonly happens in walking and particularly in brisk forms of this exercise, the metabolism may be increased more than 125 per cent. Furthermore, in some of the experiments it was ascertained that as much as one fifth of the energy expended by an average sized man in walking is required merely to raise the body at each step. If to this is added a certain amount of energy necessarily required in turn to lower the body each time after it has been raised, it will become apparent that a very important factor in the energy consumption in walking in a horizontal direction may be the type of step employed.

When the speed of progression is increased, as happens in rapid walking and still further in running, there is not only a considerably greater total expenditure of energy, but also a larger output per unit of progress accomplished. From the standpoint of the energy involved, therefore, appropriate walking is an exercise physiologically more economical than is running over the same distance. The apparent disadvantage may be accounted for in a variety of ways. In rapid walking there is commonly a very considerable extraneous muscular movement, the arms being swung back and forth vigorously with each step. Aside from this is the added fact that there is a change in the mode of locomotion. In running, the steps are taken much more rapidly and considerably shortened, and the body is raised to a much higher point at each step. The body is actually lifted to nearly twice the height that it is raised during walking. These facts alone serve to explain why, in walking, work can be done more economically than in running. Benedict and Murschhauser[2] suggest that any type of locomotion, therefore, which minimizes the raising of the body is the most economical. As a natural outcome of the study it will be seen that it would be desirable for athletes and others interested in the work of forward progression to develop a gait which will eliminate these two apparently unnecessary and extraneous factors, each of which requires the expenditure of a considerable amount of energy which is not directly contributory to the motion of forward progression.

1. Benedict, F. G.: Proc. Am. Phil. Soc., 1910, xlix, 162.
2. Benedict, F. G., and Murschhauser, H.: Energy Transformations During Horizontal Walking, Carnegie Institution of Washington, Publication 231, 1915, pp. 100.

On the other hand, when a wholesome energy-converting effect from exercise is desired for the purposes of physical therapy, the possible value of the more extravagant performances in rapid walking and running are equally apparent. One of the advantages of accumulating dependable information regarding the behavior of the body as a machine is that it helps to place the physiology of exercise on a rational scientific basis.[3] The muscular performance of the workman and the soldier often needs to be considered from an angle different from that of the athlete and health seeker. In all cases, however, it should be envisaged with such intelligence as modern physiology can offer.

CONDENSED MILKS FROM THE STANDPOINT OF FOOD HYGIENE

The condensed milk industry in the United States began in 1856 with the granting of a patent, for "concentrating sweet milk by evaporation in vacuo." Today there are in this country more than 300 establishments, having a capacity of 15,000,000 pounds daily. The statistics for 1909, the latest at hand at this moment, show an annual production of about 500,000,000 pounds, valued at more than $33,000,000. These data are sufficiently impressive to make it worth while to inquire now and then about the status of condensed milk from the hygienic as well as from the economic standpoint.

It may be asked, first of all, what is supposed to be accomplished by converting fresh milk into the conserved product. It is very doubtful whether the use of condensed milk can be defended primarily on economic principles. Obviously it cannot be cheaper than ordinary fresh milk having the same food value, otherwise the cost of manufacture would be gratuitous. By removing part of the valuable butter fat or cream from milk, however, it is possible to reduce both the price and the food value of the condensed product. Bengston[4] has pointed out that the price of condensed milk has decreased with improved and cheaper methods of manufacture. In 1880 the average value per pound in the United States was 12 cents, and in 1890 it was 9 cents. At present it is slightly more than 9 cents, because of the fact that standards have been more definitely set. A price as high as 30 cents was reported in Massachusetts in 1890. Theoretically the differences in price should, to a certain extent, furnish a criterion of the quality of the product. This was probably true to a greater extent formerly than at present, when there is greater uniformity in the quality of the different brands manufactured.

A prominent argument in relation to the use of condensed milk is found in the fact that the removal of a large proportion of water from milk by evaporation improves the keeping qualities, and reduces the labor and expense of subsequent handling and transportation of the product, through the saving in bulk and weight.

Much as we may prefer a supply of fresh milk under ordinary circumstances, and particularly in connection with infant nutrition, in which canned milks have been charged repeatedly with the initiation of malnutrition, it must be recalled that there are circumstances in which the fresh supply may temporarily fail. Condensed milks, evaporated milks and desiccated milks are called on at times to solve the difficulties of a local deficit, particularly in places like the Philippines, where cow's milk in some form or other is a real desideratum. In those cases in which it is necessary to use condensed milk in infant feeding, it should not be forgotten that certain brands have been heavily sweetened with added sugar (sucrose).

In the condensing of milks the raw milk should first be subjected to pasteurization, because the evaporation in vacuo may be carried out at a temperature considerably below 100 C. (212 F.), and some bacteria may thus survive. It should be appreciated that condensed milks, particularly of the sweetened variety, are not always sterile, though they are commonly believed to be so. Miss Bengston, of the Department of Bacteriology at the University of Chicago, has furnished some significant statements on this subject. She reports that as far as investigated, the bacterial content of condensed milk appears to be limited, although counts as high as 1,000,000 per cubic centimeter have been found in a few cases. It is doubtless true that the viscosity of the medium, and, in the case of the sweetened milks, the high sugar content, tend to inhibit the growth or multiplication of certain of the organisms present. Andrewes in England, however, has proved experimentally that the organism *Staphylococcus aureus* could multiply enormously in condensed milk, under both aerobic and anaerobic conditions. The kinds of bacteria which have been found in condensed milk bear a close relationship to those found in ordinary fresh milk, or, more properly speaking, to those found in pasteurized milk. The organisms present are those which survive the pasteurizing process and also those which may enter from the air and from other sources in the processes of condensing and canning. The following varieties of bacteria have been isolated by different workers: streptococcus, staphylococcus, *B. enteritiditis sporogenes,* lactic acid producing bacilli, *B. subtilis, B. mesentericus,* and yeast cells. *B. coli* has been reported in one or two investigations.[4]

The widely growing use of condensed milks suggests the desirability of greater information, not only with reference to the nutritive make-up of each brand or type, but particularly with respect to its bacterial condition. So long as these milks are used as infant foods, they must be made available in absolutely safe form.

3. The Efficiency of the Body as a Machine, editorial, THE JOURNAL A. M. A., Oct. 9, 1915, p. 1283.
4. Bengston, Ida A.: A Study of Condensed and Evaporated Milks, Jour. Home Economics, 1916, viii, 29.

TEMPERATURE VARIATIONS AND HEALTH

It has become clear recently that variations in temperature represent one of the best tonics provided by Nature. Lauder Brunton believes that tuberculous patients will not get better in a climate that does not vary from 20 to 30 degrees every day. Indeed, more than one observer has hinted that the principal element of therapeutic value in the altitude treatment of tuberculosis consists in the variations of temperature obtaining to a greater degree at altitudes than in low lying districts. Too large variations of daily temperature may be overtrying for delicate persons, but, as a rule, a definite drop in temperature during the night, so that the morning air is distinctly bracing by contrast with the midday temperature, is a source of stimulation. To remain in a room of definite unmodified temperature for three or four hours produces a jaded feeling and a loss of appetite. Even a brief walk or a ride in the open air of a winter's day will restore good feeling, arouse appetite and stimulate digestion better, perhaps, than any other measure.

Recent investigations on ventilation indicate that the problem of heat diffusion is more important for comfort and general good feeling than the question of perfect chemical purity of the air. Even though the air in a room is free from chemical and biologic impurities, and yet is quite still, one becomes uncomfortable if the temperature remains equable. Movement of the air by a fan, without change in the temperature, lessens the discomfort, stimulates a person to mental activity, and produces a better feeling. The introduction of cool fresh air from without is stimulating not so much because of its purity as because it leads to the dissipation of heat which has been accumulating in the body, gradually producing an unbearable sense of discomfort. Human nature has in recent years endeavored by every possible means to make the temperature in the immediate neighborhood as invariable as possible and to keep it constant; but the effect of such a state of affairs is to lessen initiative, dampen energy and hamper the power of accomplishment. Cooler air is uncomfortable for the moment, but the reaction that ensues brings with it a distinct sense of well being.

The broader discussion of this subject concerns the effect of a changeable climate on human progress and power of achievement. Ellsworth Huntington,[1] after a careful study of meteorology in reference to man, concludes that civilization in the broader sense of the term is largely dependent on man's being subjected to considerable variations of temperature in his environment. Whenever white men in spite of their natural initiative and tendency to efficiency have to live and work in a tropical climate, they degenerate physically, mentally and morally. This, Huntington insists, is due not so much to the high temperature as to the monotony of an unvarying climate and the consequent lack of Nature's most effective stimulation. By observation of the amount of work done throughout the year by negroes and white men laboring under similar conditions in warm and temperate climates, he deduces that "it seems to be a law of organic life that variable temperature is better than uniformity" for human achievement.

It has long been recognized that man's highest achievements have been made in the variable climate of the north temperate zone. Indeed, if the fortieth parallel of north latitude be traced around the globe, it will be found that practically all the great centers of human achievement were situated not far away from it. Athens, Constantinople, Naples, Rome, Florence, Paris, Vienna, Berlin, London, New York, Chicago, St. Louis, San Francisco, Tokyo and Peking, as well as Jerusalem, Carthage, Sidon, Tyre, Memphis and Babylon were all situated within about 10 degrees of this magic line. Almost needless to say, this is the line of greatest variation in temperature. It would seem, then, as though the conclusion as to man's efficiency under circumstances in which he is subjected to considerable daily, monthly and yearly variations of temperature must be accepted.

This represents an almost absolute contradiction of some of the ideas, often accepted even by physicians, with regard to the relation of comfort in nonvariable temperatures to efficiency and helpfulness. It also suggests a pause in the medical practice of sending invalids to a mild climate during the winter unless they are of such delicate constitution, or so run down in health, that they cannot stand the cold because they have not the vitality to furnish a good reaction to bracing cold air. Consumptives are often comfortable in a mild unvarying temperature, as in our own South or on the Riviera or the North African Coast, but the general agreement is that they do not make satisfactory progress against their disease. The same thing would seem to be true as regards neurasthenics and semi-invalids. The bracing tonic qualities of a northern winter in a dry climate under proper safeguards will probably do them more good, though at times they will be less comfortable than they would be in a warm southern atmosphere.

While northern winters in their extreme variableness are often exasperating and would seem to make for disturbance and reduction of vitality, it is likely that they are rather prone to produce the opposite effect and have a favorable reaction on vitality and resistance to disease. Certainly many a man who has had to go South with an invalid relative during a winter has found during the following summer that he actually missed the winter and its stimulating effect, and that the summer weather, as a consequence, was doubly prostrating. Something of this at least is more

1. Huntington, Ellsworth: Civilization and Climate, New Haven, Conn., Yale University Press.

than probably true for many persons of subnormal health. Provided their vitality is sufficient to enable them to stand successfully the vicissitudes of a northern climate, such persons emerge from a winter in it in better condition than if they passed it more comfortably in a milder, less changeable environment.

ACQUIRED TOLERANCE OF MORPHIN

The marked tendency toward habit formation which is so conspicuous and deplorable in connection with the use of morphin is associated with an enormously increased tolerance for the drug. How this is acquired and what is signified by the ability to take doses of a substance which ordinarily would prove highly toxic or even fatal to the nonhabituated individual have been the subject of much discussion. To say that the tissues become adapted to the presence of morphin merely clothes in words our ignorance of the real nature of the tolerance which develops.

In extreme tolerance, the daily quantity used may reach ten times the ordinary toxic dose. A favorite explanation holds that the oxidative powers of the organism are increased with the prolonged use of the drug. The evidence for this view is sought in Faust's well known experiments showing that dogs which have become accustomed to morphin reach a stage at which they no longer excrete it in the feces.[1] From this it has naturally been assumed that more of the poison is destroyed in the tolerant organism than is usually the case. That this increased destruction cannot be the sole factor in enhanced tolerance to the drug was shown by Rübsamen,[2] who found that after large injections of morphin, immune rats may still contain a quantity of undestroyed poison larger than the lethal dose for the normal individual of this species. Cloetta[3] accordingly assumed that there must be a tissue immunity factor.

Ordinarily, in these studies on the nature of increased tolerance, the behavior of the organism as a whole to the drug has been the subject of observation. The specific physiologic functions involved in the action of morphin are, however, quite manifold. It has seemed desirable, therefore, to investigate the problem of enhanced tolerance in relation to several of these functions separately in the hope of throwing new light on the problem. The respiration is one of the bodily activities peculiarly responsive to morphin.[4] This drug may, for example, exhibit an unmistakable effect on breathing after the administration of doses far too small to produce the more characteristic profound narcosis. In the pharmacologic institute at the University of Utrecht, van Dongen[5] has found that it is actually possible to accustom the respiratory center to morphin. The tolerance developed was complete, even to a dose 1,800 times as large as that to which the breathing function was initially responsive. The nervous centers concerned in the characteristic dilatation of the pupils under the influence of morphin are also shown to be entirely immunized to the action of the drug in tolerant dogs. Other centers are not so easily affected; thus the gastric manifestations are not so readily dispelled by the development of a general tolerance. The vagus center, in fact, seems to be unaltered in responsiveness, despite the exhibition of pronounced immunity in other functions. Even in dogs with marked tolerance for morphin, a slowing of the pulse is manifested with every dose of the drug.

It thus becomes evident that different functions or different centers of nervous response exhibit increasing immunity to morphin with unlike readiness. Even such structures as the vomiting center, the respiratory center and the vagus center, all of which lie near to each other anatomically in the spinal bulb, show a different behavior in the course of the development of tolerance. The relative readiness with which they become unresponsive by no means corresponds with their comparative sensitiveness to the drug in the unhabituated organism. In the judgment of van Egmond[6] and van Dongen,[5] all of the facts cited confirm their conclusion that the older theory of augmented oxidative capacity in the body will no longer suffice to explain the phenomena of tolerance to morphin. We must further postulate a specific tissue immunity that is acquired in unequal degree and with unlike readiness by different organs and centers of the body.[7]

THE RIPENING OF APPLES

Fruits are entering into the dietary of man in this country more largely today than ever before. It therefore becomes important to learn the details of their composition and to ascertain the best conditions under which they can be marketed for use as food. That fruits, like many other plant products, are not suitable for human consumption until they have reached a certain stage in growth, termed ripeness, is known to all. In some cases this corresponds with the period at which the fruit is harvested. It is less well realized, however, that there are many fruits which reach the proper edible stage only after a longer or shorter period of storage following removal from the parent plant.

1. Faust, E. S.: Ueber die Ursachen der Gewöhnung an Morphin, Arch. f. exper. Path. u. Pharmakol., 1900, xliv, 217.
2. Rübsamen, W.: Experimentelle Untersuchungen über die Gewöhnung an Morphin, Arch. f. exper. Path. u. Pharmakol., 1908, lix, 227.
3. Cloetta, M.: Ueber das Verhalten des Morphins im Organismus und die Ursachen der Gewöhnung an dasselbe, Arch. f. exper. Path. u. Pharmakol., 1903, L, 453.
4. The Opium Alkaloids and Respiration, editorial, THE JOURNAL A. M. A., Feb. 12, 1916, p. 514.
5. Van Dongen, K.: Beiträge zur Frage der Morphingewöhnung, Arch. f. d. ges. Physiol., 1915, clxii, 54.
6. Van Egmond, A. A. J.: Ueber die Wirkung des Morphins auf das Herz, Arch. exper. Path. u. Pharmakol., 1911, lxv, 197.
7. In translating these facts and views into a general theory applicable in all cases, it must be borne in mind that not all animal species exhibit the phenomenon of acquired tolerance to morphin. Among laboratory animals the rabbit forms a notable exception, according to van Dongen.

As a rule this later ripening involves a decrease in acid and starch along with an increase in sugar content. Oxidation processes also go on in the fruit, with the development of those special substances, possibly esters in some cases, which furnish the peculiar aroma or flavor of the individual species. The banana, picked green, exhibits a conversion of starch into sugar as the fruit subsequently ripens. This change is attended by a sort of respiration process, for it does not go on normally in the absence of oxygen. The peach, on the other hand, contains no appreciable amount of starch at any time, but shows a steady increase in sugar content as it approaches maturity.[1]

Although the apple is easily the most important of the fruits of its class, there is little widespread information in regard to the chemical changes which attend its ripening. The starch content reaches a maximum in midsummer while the fruit is still on the trees, and then begins to decrease. Some varieties of apples are ready to eat when they are removed from the trees. The larger number, however, are expected to ripen to a considerable extent after that period. For this reason, the varieties which mature more slowly exhibit a superior keeping quality. When once the ripening process has been completed, the fruit tends to become soft, mushy or overripe, and usually at this or some preceding stage, organisms of decay gain entrance to the tissues, and the fruit rots. In the absence of infection with any germs of disease or decay, the fruit loses water and shrivels up into a withered dry mass. Changes of this character go on, no matter whether the fruit remains on the tree or is picked off. Growth ceases, and chemical changes ensue which result in the development of characteristic odor and flavor and later in the disintegration of the flesh of the fruit.

The object of the storage or preservation of fresh fruit so that it will be available beyond its natural "season" is really to slow up the ripening process and so to prolong its period as much as possible. That temperature has an important influence on the rate of ripening is a familiar experience. Beyond this little has been appreciated in regard to the changes actually involved. It has even been believed that micro-organisms are in part responsible, though in the light of our modern knowledge of biochemical changes in plants it is more reasonable to ascribe an influence to the presence of "ripening enzymes."

With respect to the actual changes in the chemical composition of ripening apples, Bigelow, Gore and Howard[2] have found: a slight but continuous decrease in total acidity; a gradual decrease in sucrose; a gradual increase at first, followed by a later slight decrease, in invert sugar and total carbohydrates, and the disappearance of starch early in the ripening process. At the University of Minnesota, Thatcher[3] has concluded that the only enzymes which participate in the changes in the carbohydrates of apples during the ripening process are oxidases. None of the common types of carbohydrate-splitting enzymes could be found. The fact that the changes which take place during ripening are inhibited by surrounding the fruit with an atmosphere of carbon dioxid is easily explained on the basis of their being oxidase changes, since it is a well-known fact that the presence of a large excess of the end-products of a reaction generally inhibits the action of the accelerating enzyme in increasing degree as the proportion of the end-product increases. Carbon dioxid is undoubtedly an end-product of oxidase activity, and should therefore accomplish just the result which was found to occur. With such facts regarding the "respiration" of ripening available, it is not unlikely that they may later be applied in addition to current methods of cold storage to the problem of conserving one of the most valued foods that enters into the human dietary both in health and in disease.

1. Sherman, H. C.: Food Products, New York, the Macmillan Company, 1914, p. 343.
2. Bigelow, W. G.; Gore, H. C., and Howard, B. J.: Studies on Apples, U. S. Dept. Agr., Bur. Chem., Bull. 94, 1905, pp. 100.
3. Thatcher, R. W.: Enzymes of Apples and Their Relation to the Ripening Process, Jour. Agric. Research, 1915, v, 103.

A MECHANISM OF PROTECTION AGAINST BACTERIAL INVASION

"The mere fact that both animals and man are in constant contact with infectious micro-organisms, many of them in a high state of virulence, indicates in itself that the individual disposes normally over a defensive mechanism of considerable efficiency." These words, from a recent volume,[4] express a situation which has long been the subject of speculation and experiment. Of course, the sound, healthy skin and the mucous membranes ordinarily offer an effective resistance to the entrance of micro-organisms into the interior of the organism. But even when organisms have succeeded in invading the tissues themselves, a second line of defense is ordinarily encountered which tends to inhibit the further progress of the germs more or less perfectly. Here the active forces reside in the phagocytic power of leukocytes and other cells and further in the bactericidal or antibacterial action of the body fluids. The latter process is commonly conceived to be disintegrative in nature, so that some form of bacteriolysis ensues.

The study of the antibacterial powers of the blood leaves no doubt that certain micro-organisms can be dissolved by lysis in the presence of appropriate serum. The question of the relative importance of the phagocytes and the "humoral" factors present in the blood in the phenomena of protection against bacterial infection has been warmly debated. Zinsser has remarked that in the prolonged controversies between the adherents of the two schools, waged with great astute-

4. Zinsser, Hans: Infection and Resistance, New York, the Macmillan Company, 1914.

ness and experimental skill, most of the facts which we possess regarding immunity were discovered. It has long been known that when bacteria are introduced into the blood and later disappear from it they are not eliminated by the organs of excretion but are destroyed in the tissues themselves. In considering the problem of the manner of the destruction, Bull[5] remarks that the dissolution of bacteria by lysis has been observed, but not in the living body. Only a part of the pathogenic bacteria, of which *Bacillus typhosus* may be taken as an example, experience solution in shed blood or its serum constituents, whereas such bacteria as pneumococcus and streptococcus are not subject to this form of dissolution.

Protection from certain forms of bacteria can be secured by the employment of immune serums. An active pneumococcus serum, for example, protects against a certain maximum quantity of pneumococcus culture. The immediate effect of the serum injection is to cause the disappearance of the pneumococci from the circulating blood, this result being produced in the incredibly short period of a few minutes. The experimental investigations of Bull at the Rockefeller Institute of Medical Research are believed to throw some light on the mechanism of the removal. He maintains that an almost immediate agglutination of the bacteria takes place. The larger the doses of the serum, within limits, the larger the size of the bacterial clumps that are found. The clumps are removed from the blood almost immediately by the organs — the spleen, liver and bone marrow. What happens next is determined by the size of the clumps. If they are large, they cannot be ingested by phagocytes; hence they soon begin to multiply, and the bacteria reinvade the blood; if small, they are taken up by phagocytes and are digested. The animal succumbs in the first case and survives in the second. Hence small doses of the serum causing smaller clumps may be more effective than large doses giving larger ones. No extraphagocytic dissolution of the pneumococci seems to occur. A similar mechanism is reported to operate in animals inoculated with cultures of the typhoid bacillus, although this organism is subject to serum lysis.

In cases of certain cultures of disease-producing bacteria like two distinct varieties of the influenza organism which may or may not be pathogenic, Bull asserts that the pathogenic effect may depend on the agglutinability of the bacteria by the blood whether of normal or immunized individuals. Thus when cultures of the nonpathogenic variety are injected into the circulation of rabbits, they are clumped and removed by the organs at once; when cultures of the pathogenic variety are inoculated, they are neither clumped nor removed.

According to this view of Bull, agglutination, the property of immune serums discovered soon after the finding of specific bacteriolysins, is a most important feature in the mechanism of protection. As he expresses it, bacteria circulating in the blood are quickly removed when they are agglutinated or clumped, and the clumps deposited within the organs are taken up by phagocytes and digested. They appear not to be destroyed by solution or lysis through the operation of serum constituents of the blood. In other words, in some cases of protection from bacterial invasion, no extraphagocytic dissolution or bacteriolysis of the micro-organisms seems to occur.

5. Bull, C. G.: A Mechanism of Protection against Bacterial Infection, Proc. Nat. Acad. Sc., 1915, i, 545.

Current Comment

THE FUNCTION OF THE PERICARDIUM

The structure of the pericardium as a tough, fibrous membrane, within the cavity of which the heart and roots of the great vessels lie almost free, suggests that its function may be to assist in checking an excessive dilatation of the heart during conditions attended by a great rise of venous pressure. The overfilling of the heart is of course prevented in part by the resistance of its own walls. Barnard[1] has shown that the pericardium not only is inextensible but also can bear an internal pressure of more than one atmosphere, a force by which the heart invariably is ruptured. That the pericardium may even ordinarily exercise some restraint on the organ within it is suggested by the easily made observation that the heart during diastole tends to protrude through a slit made in the encasing membrane. In fact, the right auriculoventricular valve may cease to be entirely efficient when the pericardium has been freely opened, the closure of this valve seeming to be somewhat dependent on the support afforded to the heart by the pericardium. By the aid of ingeniously devised experiments at the Institute of Physiology, University College, London, Kuno[2] has observed that in the absence of the pericardium it is difficult to increase the work of the heart above its usual performance without danger to the organ. When the pericardium is intact the heart may be exposed to too large a venous inflow for a considerable time without undergoing serious damage, the only effect being to weaken its action somewhat. When, on the other hand, the heart has been overdistended by too large a venous inflow in the absence of the usual pericardial restraint, not only does insufficiency rapidly manifest itself, but also signs of permanent damage ensue, so that the maximal cardiac performance can never again be brought to the same level. In a variety of ways the existence of the pericardium has been shown by Kuno to be necessary for the unimpaired working of the heart in normal life. The disturbance of the heart in the absence of the protective membrane does not end with the usually manifested functional irregularity of the heart beat which may occur in a variety of forms. Such mechanical or physiologic consequences are followed by patho-

1. Barnard: Proc. Physiol. Soc., Jour. Physiol., 1898, xxii, p. xliii.
2. Kuno, Y.: The Significance of the Pericardium, Jour. Physiol., 1915, p. 1.

logic changes wrought by the overdistention. Valvular insufficiency, especially of the auriculoventricular valves, is a common occurrence when there is extreme distention. Additional injury is evidenced by the consequent ruptures of the heart muscle and the hemorrhages which may be found in the outer and inner layers of the heart wall. As a rule they make their appearance when the strain of the heart is approaching its maximal working capacity, and are especially frequent in the inner wall of the left ventricle, over the whole surface of the heart and in the septum. Such a story of valvular inefficiency, hemorrhage and irregular action is thus sufficient to indicate the beneficent advantage of an intact pericardium as a factor of safety when the work of the heart is increased, as it often must be, above its normal level.

HENRY BAIRD FAVILL

Dr. Henry B. Favill, whose obituary appears elsewhere in this issue, was an unusual man. As a physician he represented modern scientific medicine, and his practice was large. He took active part in the work of local, state and national societies, and when he discussed scientific medical questions he was listened to as one speaking with authority. However, while his interest in medicine was great and his practice large, his interest in social questions and in public welfare was so extensive as to make his medical work seem almost incidental. As a citizen of Chicago he was intimately identified with those forces which are seeking to bring about purity and efficiency in public works and service. He was one of the moving spirits in the organization of the City Club — an institution which has done much to bring about better conditions in Chicago. He did effective work as chairman, and executive officer, of the Municipal Voters' League of Chicago, which position he occupied for three years. During that time he naturally made many enemies, but in spite of the attacks made on him by ward politicians and others, he emerged from this work with reputation unspotted. He was a man of altruistic ideals, but at the same time was practical: he attacked all problems with a broad conception of humanity and its weaknesses. With absolute unselfishness, he accepted leadership in many movements which he knew would bring on him attacks by those injured. As chairman of the Council on Health and Public Instruction, his advice was regarded as that of a man who looked at the problems not alone from the viewpoint of the physician, but also from that of the publicist. As the Chicago *Herald* said, "No class was big enough for him. His interest and his service belonged to all groups. The mere recital of the agencies and organizations which he touched indicates something of the generosity of his outlook. He was a pioneer in public health betterment, in civic reform and in social readjustment. He was a forerunner in the creation of the new conscience." We need more of the spirit that controlled Dr. Favill in his activities; he stood for the ideal that the responsibilities of citizenship rest more on the medical profession than on any other class.

THE STIMULATION OF MAMMARY DEVELOPMENT

The scientific evidence regarding the possible factors responsible for the development of the mammary glands to a condition in which they are competent to function as milk-secreting organs was discussed in THE JOURNAL[1] some time ago. The phenomenon of the genesis of lactation is of such fundamental importance for human welfare as well as animal existence that it inevitably provokes interest and speculation. What subtle influence prepares the rudimentary tissue so ideally for its evolution into an active gland at the proper time and only under the circumstances connected with an expected parturition? The development of experimental technic, particularly in the field of transplantation of tissues, has greatly facilitated investigation of this subject. It will be recalled that the physiologist Steinach transplanted ovarian tissue into young male rats and guinea-pigs which had previously been castrated. The mammary glands and the nipples always present in rudimentary form in every male thereupon began to develop and presently exhibited feminine characteristics. In some cases the hypertrophied glands actually appeared capable of functioning in the usual manner. These surprising and significant observations have lately been repeated in the physiologic laboratory of the medical faculty at Lisbon by Athias.[2] They show anew that the development of the mammary gland is influenced by a "hormone" elaborated from ovarian tissue. A comparable influence emanating from other tissues that might be expected to participate in this cycle, namely, the placenta and uterus, has not been thus clearly demonstrated. The presence of these organs along with the fetus, therefore, by no means appears indispensable for the genesis of mammary functions, if they can be so readily provoked in the castrated male. The facts cited do not imply that other agencies are without any significance in modifying the activity of the gland; it is rather the capacity for performance — the development of an efficient mammary organ — which can be brought about through indirect ovarian influences. Athias suggests that perhaps a residue of maternal ovarian products in the circulation of the new-born may account for the well-known secretion of "witches' milk" in the infant.

DISCOVERY OF THE CAUSE OF WEIL'S DISEASE

Acute epidemic or infectious jaundice, commonly designated as Weil's disease, is so infrequently observed that it has not previously been the object of extensive study. Although bacteria of the proteus group have been found so frequently in association with this disease that they were at one time thought to be the cause, subsequent investigation eliminated them as the specific cause, although the possibility of an associated rôle remained. Recently independent investigations have shown that improved methods

1. The Physiology of Lactation, editorial, THE JOURNAL A. M. A., March 2, 1912, p. 638; Virgin Lactation, March 23, 1912, p. 860.

2. Athias: L'activité sécrétoire de la glande mammaire hyperplasiée, chez le cobaye male chatré, consécutivement à la greffe de l'ovaire, Compt. rend. Soc. de biol., 1915, lxxviii, 413.

were adequate to elucidate the problem. Results reported by Hübener and Reiter[1] and Uhlenhuth and Fromme,[2] who have been working simultaneously and independently on this disease, establish the ready transmissibility of this disease to laboratory animals, the guinea-pig being especially susceptible. Mice and rats are not susceptible, and this fact has an important bearing on the epidemiology of the disease. It is not spread from infected to normal animals living with them. Immune animals are refractory, and their blood contains antibodies. The virus is filterable through Berkefeld filters. In the tissues and blood of infected animals, Hübener and Reiter have found constantly spirochetal organisms, which are especially abundant in the liver in accordance with the predominance of the changes in that organ during the disease in man. These spirochetes seem to show unusual variability in form, there being no constancy in their morphology. Hence they are quite distinct from the *Spirochaeta pallida*. Often they show swellings and nodules, and the name *Spirochaeta nodosa* is proposed for them. At the Christmas meetings of the Society of Experimental Pathology, Noguchi reported his study of infectious jaundice in Japan, where the disease seems to have the usual characteristics of Weil's disease. Other Japanese observers had demonstrated the transmissibility to laboratory animals, filterability of the virus, and the presence of spirochetes in the tissues, which observations were confirmed by Dr. Noguchi. Hence it would seem that the causative agent of this disease has been discovered independently in Japan and Germany. This should afford much assurance as to the certainty of the fact, although perhaps it opens the way to controversies concerning priority.

1. Hübener and Reiter: Deutsch. med. Wchnschr., Oct. 21, 1915; ibid., Jan. 6, 1916.
2. Uhlenhuth and Fromme: Med. Klin., Oct. 31, 1915.

Safety Congress

The National Safety Council has just issued a report of its fourth annual safety congress, held at Philadelphia, Oct. 21, 1915. C. W. Price, assistant to the Industrial Commission of Wisconsin, was chairman. Representatives from many of the large industrial concerns of the United States were present, and an outline of the safety methods and organization of safety work in each of the industries represented was given, followed by discussion. There does not seem to be any general standard or uniformity of organization, each plant having worked out its own plan. In most of them, however, workmen's committees assisted in the propaganda of individual safety and greater care as well as care for the safety of fellow workmen. The discussion has been printed in a pamphlet which may be had from the chairman. It contains many valuable suggestions in regard to the factory safety movement.

In this connection, the Department of Labor and Industry of Pennsylvania, John Price Jackson, commissioner, issues a series of four- or eight-page pamphlets in regard to accidents and disease in the factory, bearing such titles as "Timely Hints to Employer and Employee"; "Timely Hints to Elevator Operators"; "Timely Hints for Steam Boiler Firemen and Attendants"; "Timely Hints for Employees in Mercantile Establishments"; "Timely Hints for Painters," for printers, etc. They warn against the dangers of each occupation and give suggestions for the prevention of accidents and the avoidance of the diseases of the particular occupation. They will help in the safety movement.

Medical News

(PHYSICIANS WILL CONFER A FAVOR BY SENDING FOR THIS DEPARTMENT ITEMS OF NEWS OF MORE OR LESS GENERAL INTEREST; SUCH AS RELATE TO SOCIETY ACTIVITIES, NEW HOSPITALS, EDUCATION, PUBLIC HEALTH, ETC.)

ARIZONA

State Association Names Counsel.—To complete the plans of the Arizona State Medical Association for medical defense in the state, Leroy Anderson, an attorney of Prescott, has been appointed official counsel for the organization.

Work of State Laboratory.—In 1914-1915, the state laboratory examined 386 out of 461 collected samples of foods, drinks, flavoring extracts, condiments, water, etc. Of these, 268 were commercial samples of foods, etc., of which seventy-six, or 28.4 per cent., were found to be adulterated or misbranded, or both. Many of these goods were manufactured or prepared outside the state and dealers had legal guaranties on them, so that under the Arizona food laws prosecutions could not be instituted. Outside dealers were in all cases informed and warned concerning the violations. Considerable improvement has been made in the importation of illegal goods.

CALIFORNIA

Lepers Escape from Hospital.—Two lepers escaped, February 3, from the Los Angeles County Hospital after severely beating two trusties, also lepers, who were on guard duty.

Lane Lecture.—The second of the series of popular medical lectures to be given under the auspices of the medical faculty of Leland Stanford Junior University took place at Lane Hall, San Francisco, January 29. Prof. M. S. Wildman of Stanford University spoke on "The Economic Aspect of Disease."

Charts Illustrating Death Rates.—Mr. John H. Mellon, secretary of the Health Department of Oakland, has recently prepared a series of charts illustrative of the death rate in that community. The charts are devoted to tuberculosis, annual birth and death rates, deaths from various diseases, and a special chart on typhoid cases reported by months.

Personal.—Dr. Herbert S. Anderton, San Francisco, was slightly injured, January 23, when his automobile skidded and crashed into a telephone pole.——Dr. Wilbur A. Sawyer, Berkeley, secretary of the state board of health, attended a conference of physicians and social workers at San Antonio, Texas, February 5, at which he was the guest of honor at a luncheon given by the executive committee of the Southwestern Conference on Tuberculosis.——Dr. Frank B. Cohn, resident physician at the Emergency Hospital, Oakland, has resigned, and Dr. H. E. Franck has been appointed his successor.——Dr. Shadworth O. Beasley, San Francisco, has returned after war service in Serbia.—Dr. Louis D. Green, San Francisco, returned from a trip to Amritsan, India, January 25.

DISTRICT OF COLUMBIA

Speak and Testify in Washington.—Dr. John R. Williams, Rochester, N. Y., delivered an illustrated address before the George Washington University Medical Society, February 19, on "Recent Developments in the Study and Treatment of Diabetes Mellitus."——Prof. Charles Wardell Stiles, U. S. P. H. S., talked to the Cosmos Club, on February 14, on "Some Medical Aspects of the Race Question in the South, with Special Reference to the Hookworm."——Drs. Isadore Dyer, New Orleans, La.; Henry M. Bracken, St. Paul; Howard Fox, New York, and Frank H. Parker, superintendent of the Massachusetts Leper Colony, at Penikese Island, Mass., were in Washington, February 14, to testify before the Senate Committee on Public Health and National Quarantine concerning the proposed national leprosarium.

ILLINOIS

Scarlet Fever.—The state board of health is making strenuous efforts to prevent a widespread epidemic of scarlet fever following an outbreak of 100 cases in the Military Academy at Alton. The school authorities sent the 200 students to their homes after many of them had been exposed to infection.

State Hospitals Association Meet.—The Illinois State Hospitals Medical Association met at the Jacksonville State

Hospital, February 24 and 25, and discussed institutional diversions; reeducation of the demented; the Wassermann reaction in the feebleminded; the treatment of general paralysis of the insane; arteriosclerosis of the brain and cord; diphtheria carriers; alcoholic psychoses, and anociassociation.

Personal.—Dr. William L. Kreider, Prairie City, one of the oldest practitioners of McDonough County, is critically ill as the result of a cerebral hemorrhage, February 11.——Dr. George P. Gill, Rockford, who has been serving with the British Expeditionary forces in France, arrived in Boston, February 11.——Dr. Clarence M. Cheadle, Rockford, reached New York, February 11, after several months' service in Serbia.

Baby Week.—Baby Week is to be observed throughout Illinois, March 4 to 11, and Baby Health Conference Week, May 8 to 12. The outline of work for the week, as suggested by the state board of health, is as follows:

Saturday, March 4: Inauguration Day. Opening of headquarters of Baby Week Organization. Mass meeting; addresses by Mayor or health officer and representative of Baby Week Organization. Distribution of helpful literature, etc.

Sunday, March 5: Baby Sunday. Appropriate sermons in all churches in morning; address by competent medical men from pulpits in evening. Carefully prepared articles in Sunday newspapers, suitably illustrated.

Monday, March 6: Little Mothers' Day. Talks and demonstrations on care of baby and its surroundings to school, to school girls of above sixth grade, by competent nurses or physicians. Inspection of schools and surroundings.

Tuesday, March 7: Fathers' and Sons' Day. Suitable talks to men and boys by physicians fully competent to handle the subject.

Wednesday, March 8: Mothers' Day. Suitable talks to women, ranging from parental care to adolescence. As a special mark of respect to mothers, all men and boys might be asked to wear some white flower throughout the day.

Thursday, March 9: Demonstration day. Special demonstrations of baby bathing, dressing, sleeping and feeding, including home pasteurization, home care of milk, and modified cow's milk; sample meals for older children; suitable exercises for children; out-door sleeping; home and community sanitation; exhibits, motion pictures, etc.

Friday, March 10: Community Day. Get-together meeting of officials and citizens; plain talks on duties of citizens and officials; presentation of petitions for civic improvements and hearing of thereon. Conference with milk dealers and food handlers. Special plea for birth and death registration and for enforcement of rules governing contagious diseases.

Saturday, March 11: Permanent Organization Day. Joint meeting of executive committee and active workers for Baby Week. Plans for future, including Baby Health Conference Week, May 8-12. Permanent organization of Child Welfare Society with appointment of committees about as follows: Executive Committee; Committee on Baby Health Conference Week, including in membership physicians appointed by county medical society; Committee on Clean-Up Campaign, with subcommittees on Fly and Mosquito Extermination; Committee on Inspection of Dairies and Food Handling Establishments; Committee on Law Enforcement.

Sunday, March 11: Review Day. Summary of work accomplished during Baby Week and plans for future activities to be subject of talks from pulpit. Review to be published in Sunday newspapers.

The organizations engaged in preparing programs for Baby Week have been asked to incorporate in their programs the subject of the Conference Week. The baby health conferences are more scientific in character than the more familiar better baby contest. They are calculated to serve as practical demonstrations of the service of infant welfare stations or clinics and to impress on visitors the importance of establishing such stations. For these conferences the standard score card for babies and the anthropometric table issued by the American Medical Association will be employed in determining the mental and physical status of each child submitted for examination. The Illinois State Board of Health will supply for these conferences, on request, pamphlets on "How to Organize a Baby Health Conference"; "How to Score Children by Scientific Methods," standard score cards for babies, anthropometric table for male and female children, and a booklet on "Our Babies—How to Keep Them Well and Happy."

Chicago

Smallpox at County Hospital.—Eight cases of smallpox have recently occurred at the Cook County Hospital. Five wards have been put under quarantine and wholesale vaccination has been practiced.

Lepers in Chicago.—Physicians, nurses and others who testified before the Senate Health Committee, February 15, in support of a bill to establish a national leprosarium, stated that there were about eighty lepers free in Chicago.

Personal.—Dr. William M. Thompson was slightly injured and his automobile was demolished in a collision with an automobile truck, February 14.——Dr. Fred W. Moeller reached Boston, February 11, after service in the war zone.

Typhoid Due to January Flood.—The department of health has traced thirty-six cases of typhoid fever to the water supplied by the Sixty-Eighth Street pumping station and all living south of Twenty-Second Street have been warned to boil the drinking water. The infection is believed to have been due to the overflowing of the sewers during the January floods.

KENTUCKY

Vaccination.—Dr. Jesse I. Whittenberg, Louisville, health officer of Jefferson County, has been informed by the attorney for the school board of Highland Park that the board will no longer resist the order requiring vaccination of the pupils in the schools of Highland Park, a suburb of Louisville.

Quarantine Against Illinois.—The Kentucky Live Stock Sanitary Board, on January 31, established a quarantine against all cattle, sheep and other ruminant animals and swine originating in Illinois, north of the south boundary of Jersey, Macoupin, Montgomery, Shelby, Cumberland and Clark counties.

Henderson County Sanatorium.—Henderson County has almost completed the first sanatorium to be established in the state under the new law. It has cost about $20,000, and consists of a central or administration building of brick, and two frame wards for the housing of patients. Advanced cases of tuberculosis will be quartered on the second floor of the administration building.

MAINE

Personal.—Dr. Stanwood E. Fisher, Portland, has been elected a member of the city government.——Dr. William C. Whitmore has been elected city physician of Portland.——Dr. Charles M. Sleeper, South Berwick, has been appointed collector of customs for the district of Maine.

State Antituberculosis Association Meeting.—Dr. William C. Peters, Bangor, has been elected president and Dr. John E. Wadsworth, Skowhegan, a vice president of the Maine Antituberculosis Association. The association has voted to ask the legislature for an appropriation of $4,000 for the 1917-1918 biennium.

MARYLAND

Personal.—Dr. John C. Hemmeter has been elected a Fellow of the Royal Society of Arts of England, in recognition of his work on diseases of the stomach.——Dr. Harry F. Shipley, Granite, is a patient in Mercy Hospital, suffering from a general breakdown, and is reported to be progressing favorably.

Infant Mortality Probe.—The federal Children's Bureau has started an investigation to ascertain the cause of the death rate among infants in Baltimore. The mortality every year reaches about 2,000. Twelve agents who have had special training will undertake the investigation, and have obtained from the health department statistics concerning every baby born in Baltimore during 1915, each one of whom will be visited. Miss Emma Lundberg, child welfare expert of the federal bureau, is directing the investigation.

Doctors Protest.—At the meeting of the Baltimore County Medical Association, held at the Mercy Hospital, Baltimore, a resolution attacking a bill which will be introduced into the legislature was unanimously adopted. This bill prohibits any physician, except those duly qualified by law, from compounding medicines. An exception is made in the bill for cases of emergency. The association also went on record as approving the bill appropriating for two years the sum of $25,000 a year to the University of Maryland School of Medicine (and College of Physicians and Surgeons).

Appropriation for Public Athletic League Requested.—An appeal for an appropriation of $15,000 for each fiscal year was made to the General Assembly of Maryland on behalf of the Public Athletic League, by Dr. William Burdick, director of the league. The work of the league among the boys and girls of the state has so increased that the $4,000 annually which the last legislature gave is not sufficient to meet requirements. It is generally recognized that the bill is a worthy one and that the league is doing a splendid work for young people, in developing their characters as well as their bodies. It has gradually extended its work until most of the public schools in the city and the more thickly populated sections of the counties have been reached. In the last fiscal year of the league, its revenues amounted to about $30,000. Of that sum, the state gave $4,000; Baltimore, $6,000; private institutions benefiting by its work, $5,000, and individuals interested in the league, $15,000.

MASSACHUSETTS

Contributions for Surgical Dressings.—The total contributions to the Boston Surgical Dressings Committee up to February 2 was $18,722.

New Tuberculosis Hospital.—The new hospital for tuberculosis on Newton Street, Brookline, has been completed at a cost of $38,000, and is open to receive patients. The main building is two stories in height, with a one-story wing on either side, and will accommodate about twenty-five patients.

Health Service Merger.—Surg. Allan J. McLaughlin, U. S. P. H. S., state health commissioner, has recommended to the special committee on commission consolidation that the medical inspection service of the State Board of Labor and Industries be transferred to the control of the health department.

Personal.—Dr. Stanley C. Cox, Holyoke, has been appointed associate medical examiner for the Holyoke district.——Dr. John F. Fennessey has been appointed a trustee of the Boston State Hospital, and Dr. William L. Richardson a trustee of the Perkins Institution and Massachusetts School for the Blind.——Dr. Henry S. Forbes, Boston, who has been engaged in Red Cross work in Serbia for several months, has been released after three months' detention at Monastir, and is en route to Sofia.——Dr. Bernard W. Carey has been appointed a member of the Fitchburg Board of Health.

MICHIGAN

Personal.—Dr. Herman Ostrander, for twenty-seven years a member of the medical staff of the Kalamazoo State Hospital, has been appointed medical superintendent of the institution, succeeding Dr. Alfred I. Noble, deceased, and Dr. George F. Inch, who has been connected with the institution for seventeen years, has been made assistant medical superintendent.——Dr. Alvin H. Rockwell has retired as city health officer of Kalamazoo, after seven years' service.——Dr. J. Howard Van Ness has been appointed local surgeon of the Michigan Railway Company at Allegan.

Public Health.—The January bulletin of the Michigan State Board of Health, *Public Health*, is of formidable size for a state board bulletin, containing fifty-nine pages. There are eight original papers on public health topics, three of them on syphilis. Governor W. N. Ferris discusses "The Black Plague"; Dr. Arthur F. Fischer, Hancock, has a paper on "What Venereal Disease Means," and Dr. Andrew P. Biddle, Detroit, one on "Syphilis as a Social Factor." Other papers are on "Home Ventilation," "Physical Training for Busy People," "Who Goes Footloose," "How Results are Obtained in Michigan's Antituberculosis Campaign," and one by Dr. Hugh H. Young, Baltimore, on "Cancer of the Genito-Urinary Organs." Financial, laboratory and communicable disease reports, editorials and abstracts make up the remainder of a very interesting number.

MISSISSIPPI

Fraudulent Canvassers and Collectors.—See item under "General News" of this issue, page 666.

Health Survey Planned.—The matter of a health survey for Columbus has received favorable consideration from the United States Public Health Service, which will make a health survey of Columbus and vicinity during the present year.

Pellagra in Mississippi.—The State Board of Health of Mississippi has had prepared for presentation to the state legislature a statistical report of pellagra in Mississippi and suggestions to the legislature relative to its prevention and cure. The statement has been prepared by Dr. Frank L. Watkins, Jackson, deputy registrar of vital statistics. It is shown that during 1914, the death rate from pellagra was 47 per cent. greater than for 1913, and the number of cases for the first eight months of 1915 was 46 per cent. greater than for the year 1914. In 1914, the cost of the disease to the state was $2,880,111. In 1914, there were reported to the state board of health 10,954 cases of pellagra, 7,897 cases of tuberculosis and 6,159 cases of typhoid fever. The unbalanced diet theory of the causation of pellagra is accepted in the report, and it is believed to be the duty of the legislature to make provision for the alleviation of the condition. It is the opinion of the state board of health that the state should assume the responsibility of educating the people, and that counties should make provision for the treatment of those suffering with pellagra. The creation of a central institution by the state for the care of pellagrins is believed to be impracticable. The following suggestions are made: The legislature should make an appropriation of $30,000 per annum for the next biennial period, exclusively for pellagra work; provision for a sufficient number of field men to carry on an educational campaign; the education of the pupils in the public schools as to the cause and cure of pellagra; the agricultural department should encourage the keeping of milch cows and poultry and the growing of beans and peas, and also advise with regard to improving economic conditions; the state board should supply literature on pellagra; counties should be granted power to establish camps for the treatment of pellagra; all work should be under the direct supervision of the state board of health and the U. S. Public Health Service should be asked to supervise the educational campaign, to demonstrate preventive methods in one or more communities, etc.

MONTANA

Deaconess Hospital Assured.—A committee of the Methodist Church which is in charge of the Deaconess Hospital project, Miles City, announces that the plans for the new institution are making satisfactory progress and that the construction will become a reality in the near future.

Personal.—Dr. George H. Putney, Ronan, has located at Great Falls.——Dr. Clarke S. Smith has returned to Bozeman after six months' service in war hospitals in northern France.——Dr. Richard B. Durnin has been elected representative of the Cascade County Medical Society in the Great Falls Commercial Club.——Dr. James F. S. Marshall, Stevensville, has left for Calgary, Alta., where he will take up his work as a member of the Canadian Army Medical Corps.

NEW JERSEY

Personal.—Health Officer Edwin H. Coward and Dr. Edward J. Porteous, Atlantic City, and Dr. Myrtile G. Frank, Egg Harbor City, have been appointed directors of the new Atlantic County Tuberculosis Hospital.——Dr. Robert M. Curts, Paterson, is reported to be critically ill at his home.

Tuberculosis.—The *Weekly Bulletin* of the Newark Department of Health gives some interesting figures concerning tuberculosis in the city during 1915. It is said there were 834 deaths from all forms of tuberculosis. They were classified as follows: pulmonary tuberculosis, 723; miliary, 20; tuberculous meningitis, 63; tuberculous peritonitis, 11; tuberculous disease of the hip, 2; of other parts of the body, 3; general tuberculosis, 3. This shows that about seven eighths of the deaths were due to pulmonary tuberculosis. Of the total deaths from this cause, 482 were males, 241 females; fourteen deaths occurred at ages under 15; forty-seven at ages 15 to 19; sixty-eight at ages 20 to 24; 102 at ages 25 to 29; seventy-four at ages 30 to 34; 108 at ages 35 to 39; ninety-four at ages 40 to 44; seventy-five at ages 45 to 49; fifty-five at ages 50 to 55; thirty-two at ages 55 to 59; forty-two at ages 60 to 84; in twelve the age was not stated.

NEW YORK

Rosenau at Buffalo.—Prof. Milton J. Rosenau of Harvard University will deliver the Harrington lectures at the University of Buffalo Medical School during the Alumni Reunion, May 30, 31 and June 1. The subjects will be as follows: two lectures on "Anaphylaxis" and one on "Education for Public Health Service as a Career."

Buffalo Alumni Catalog.—The alumni association of the Medical Department of the University of Buffalo has issued a catalog of the medical alumni which gives a list of the names of graduates since the foundation of the university in 1846, together with the graduates of Niagara University from its foundation in 1886 until its amalgamation with the University of Buffalo.

For New Insane Asylum.—A bill is before the legislature authorizing the sale of the Mohansic State Hospital site and urging that the proceeds be used for the purchase of another site and the erection of a hospital for the insane near New York. The state hospital commission for the insane states that this step is imperative because of the present overcrowded condition of the state hospitals. The capacity of the fourteen state hospitals at the present time is 27,840 and there are 6,484 more patients housed than can be properly accommodated.

Four Doctors to do the Work of Ten.—The City Council of Buffalo, on February 4, decided to report in favor of the appointment of four city physicians at a salary of $1,800 a year in place of ten physicians who have been looking after

the indigent sick of the city, at a nominal salary. It is proposed to have four health stations where the physicians are to have their headquarters from 8:30 in the morning until 2 o'clock in the afternoon, while from 2 to 4 o'clock they will be at dispensaries. Their duties will be not only to answer sick calls, but to examine persons suspected of having tuberculosis, look after sick schoolchildren and inspect milk stations.

Vaccination.—John C. Claus was convicted in Rochester of noncompliance with the vaccination law of the state and city ordinances, and fined $25 and costs in the police court. Claus was tried once before on a similar charge. The decision arising from the first trial of this case resulted in the formation of an antivaccination society in Rochester, of which Claus was made chairman. Claus proposed to the health authorities that he would have his child vaccinated if they would agree to be responsible for any serious consequences that might arise. He sent his child, aged 7, to school every day, but on account of his refusal to have her vaccinated, she was sent home each time.

Health Messenger.—This is the name of a new publication prepared and printed within the schools of Albany under the supervision of Dr. Clinton P. McCord, health director of schools. The first number is a neatly printed twelve-page pamphlet which contains the announcement of the purpose of the *Health Messenger*, which is, of course, the improvement of health conditions among the pupils of the city schools. This is to be done each month by taking up in a practical way some subject of educational hygiene, a list of which is suggested in the *Messenger*. This number starts with contagious diseases, giving school and health board regulations regarding such diseases, with suggestions to parents, school superintendents and teachers as to precautions to be taken and manner of handling children suspected of having the initial symtoms of the exanthemata, etc. Other health suggestions and comment, together with messages from the commissioner of education, the state health commissioner, the president of the board of education and the superintendent of schools, and a cartoon help to make up the first issue of a promising experiment which is said to be new to the public schools of the country.

New York City

Personal.—Dr. Parker Syms has been appointed visiting surgeon of the City Hospital, New York, and not of the City Hospital of New York, as announced in last week's JOURNAL. ——Dr. Charles F. Sanborn has severed his connection with the Greenpoint Hospital, Brooklyn.

Semicentennial of Health Department.—The Metropolitan Board of Health will celebrate the semicentennial of its sanitary control of New York City and adjacent counties by a commemoration dinner to be given March 9. Among the speakers expected will be the mayor of New York; the State Commissioner of Health; Surg.-Gen. William C. Gorgas, U. S. Army; Dr. Walter B. James; Mr. Henry Bruere, and Dr. Stephen Smith.

No Danger in Cheap Furs.—The sensational newspaper reports regarding the possible spread of anthrax by means of cheap furs has been the subject of an investigation by the health department. According to *The Bulletin*, the cheaper furs in particular are submitted to a dressing and dyeing process which goes far to cleanse and disinfect them. The health department finds that the alarming reports as to the infectiousness of cat fur have not as yet been confirmed by bacteriologic examinations. The newspapers have reported that there were fourteen deaths from anthrax during the past year, whereas the records in the registrar's office reveal but nine cases, and in none of these was the victim a worker in fur.

NORTH CAROLINA

Contract for New Buildings Awarded.—The directors of the North Carolina State Hospital for the Insane, Raleigh, have awarded contracts for a new receiving building and nurses' home to cost about $60,000.

Study of Children's Diseases.—A bureau for the investigation of children's diseases and infant mortality will be established in Fayetteville by the Children's Bureau of the federal government, in March or April of this year. The bureau will be under the charge of Dr. Frances Sage Bradley.

Personal.—Dr. Cyrus Thompson, Jacksonville, has not been nominated for governor by the Republican party, as erroneously announced in THE JOURNAL, but has been spoken of prominently for this distinction.——Dr. David A. Stanton, High Point, has just announced his association with Drs. John T. Burrus and Hugh W. McCain, in the High Point Hospital, for the care of surgical, gynecologic and chronic cases.

NORTH DAKOTA

Board Can Enforce Vaccination.—According to a written opinion by the attorney-general, a board of health has absolute power to enforce vaccination and to compel schoolchildren to remain home until they are vaccinated. This opinion was written at the request of Dr. Charles J. McGurren, Devils Lake, secretary of the state board of health.

OHIO

Home for Medical Society.—Plans are being prepared for the construction of a building on Sixteenth Street, between Madison and Jefferson avenues, Toledo, to house the Toledo Academy of Medicine.

District Association Meeting.—The one hundred and sixty-eighth session of the Union Medical Association of the Sixth Councilor District was held in Akron, February 8 and 9. Lake Brady, Portage County, was selected as the next place of meeting, August 8. Dr. William G. Smith, Ravena, was elected president, and Dr. John H. Seiler, Akron, was reelected secretary-treasurer for the nineteenth term.

Personal.—Dr. Charles E. Sawyer, Marion, has been appointed a member of the state medical board to succeed Dr. T. Addison McCann, Dayton.——Dr. Robert C. Longfellow, Toledo, has been elected an active member of the Society of American Bacteriologists.——Dr. Raymond E. Whelan has been elected president, and Dr. Nathan N. Meyer, secretary of the medical staff of St. Elizabeth's Hospital, Youngstown.——Dr. Richard S. Moynan, Columbus, sailed for Europe, February 7.

Cincinnati

Personal.—Dr. Albert H. Freiberg has been appointed a delegate to the twelfth annual conference of the National Child Labor Committee at Ashville, also as a representative of the Cincinnati Academy of Medicine on the Medical Defense Committee of the Ohio State Medical Association. ——Dr. Karl L. Stoll is said to be held as a prisoner of war by the British in Edinburgh Castle. Dr. Stoll started for Germany, January 1, with the intention of joining the medical service of the German army.

OREGON

Personal.—Dr. Archie K. Higgs, Portland, has been appointed chairman of the committee of military, fraternal and industrial participation in Portland's annual rose festival.

Gift to Medical College.—A gift of $5,000 has been offered to the Medical College of the University of Oregon toward the construction of the first building, provided nine other similar subscriptions are secured.

PENNSYLVANIA

Tuberculosis Cottage for State Hospital.—Plans are being prepared for a one-story cottage building for tuberculosis patients in connection with the Norristown State Hospital. The building is estimated to cost $42,000.

Home Rule.—West Sunbury is the one hundred and fortieth muncipality in Pennsylvania which has come to the state department of health petitioning that it take charge of the borough, look after its sanitation, report, placard, quarantine and disinfect for contagious diseases. The town council pledges itself to make prompt payment for these services.

Personal.—Dr. Richard R. Spahr, Mechanicsburgh, sails this month for Bordeaux as a member of the Pennsylvania unit.——Dr. W. Frank Gemmill, Fawn Grove, is reported to be seriously ill with heart disease.——Dr. John A. Fritchey, Harrisburg, is reported to be critically ill in a hospital in Philadelphia.——Dr. Elmer S. Stambaugh, Thomasville, secretary of the York County Medical Society, is reported to be ill with inflammatory rheumatism.——Dr. Katrina Freudenberger, Tamaqua, was operated on for disease of the nose at the German Hospital, Philadelphia, January 13.——Dr. Alfred E. Fretz, Sellersville, has been appointed surgeon of the Philadelphia and Reading Railroad in charge of the company's interests from Perkasie to Souderton.——Dr. Levi F. Wagner has been elected prison physician of Reading.

Philadelphia

Rush Society Lecture.—The fourteenth annual Rush Society lecture and also the annual address before the Alpha Omega

Alpha Honorary Medical Society will be delivered at the College of Physicians, Twenty-Second and Chestnut streets, by Dr. Richard P. Strong of Harvard Medical School, on "An Investigation of Typhus Fever in Serbia."

John Morgan's Grave.—The alumni of the Medical Department of the University of Pennsylvania have arranged to open the crypt of old St. Peter's Church, Third and Pine streets, where Dr. John Morgan, founder of the medical school and known as the father of medicine in America, is supposed to have been interred. Drs. Swithin Chandler, Clarence P. Franklin, William Pepper and Albert D. Ferguson, Provost J. Fahs Smith, Philadelphia, and Sir William Osler have been appointed a committee to find the grave and to prepare a marker to be placed thereon.

TENNESSEE

Medical Clinic.—Contracts have been awarded for the construction of three rooms in the basement of the Municipal Building to be used for a free clinic. The clinic, which will be under the charge of Dr. Edward B. Wise, Chattanooga, as chief of staff, will, it is expected, be ready to receive patients March 1.

Tobacco Chewers Not Protected.—The Supreme Court of Tennessee, according to *Commerce Reports*, has decided that tobacco is not a food, and therefore does not come within the scope of the decisions that manufacturers of drugs and foodstuffs are liable to consumers who purchase such articles from dealers for injury resulting from negligence in allowing foreign substances to be introduced into them during the manufacturing or packing processes.

WASHINGTON

Washingtonians on War Service.—Dr. Eugene Hurd, Seattle, is now chief surgeon of the Twenty-Ninth Flying Column in the Russian service, and holds the rank of colonel, medical corps.——Dr. Spiro F. Sargentich, Seattle, after several months' service in Serbia, has reached New York on his way home.——Dr. Walter Gellhorn, Seattle, who was on his way to join the German Red Cross, is reported to be detained in Edinburgh Castle.

State Board Officers.—At the annual meeting of the Washington State Board of Medical Examiners, Dr. Royal A. Gove, Tacoma, was elected president; Dr. Daniel M. Stone, Seattle, vice president; Dr. Conrad N. B. Suttner, Walla Walla, secretary, and Dr. Roy A. Morse, Wenatchee, treasurer.——At the annual meeting of the state board of health held in Olympia, January 20, Dr. Elmer E. Heg, Chimacum, was elected president, succeeding Dr. Fred R. Hedges, Everett.

WISCONSIN

Personal.—Dr. William H. Bartran has been elected president of the Green Bay branch of the Fox River Valley Efficiency League.——Drs. Otto H. Foerster, James A. Bach, Henry B. Hitz, Franz Pfister, Alfred H. Levings, William F. C. Witte, Dennis J. Hayes, Henry V. Ogden, Louis F. Jermain, Joseph S. Cutler, William T. Lochemes and Daniel Hopkinson have been appointed members of the consulting staff to the Milwaukee Hospital for the Insane.

Hospital Notes.—A hospital is being fitted up in Colfax by Dr. Lauritz A. Larsen.——The annual report of the Luther Hospital corporation, Eau Claire, shows that during the year 1,176 patients were admitted to the hospital. The financial report shows a profit of nearly $8,000, most of which was expended for improvements. There is at present $5,000 in the building fund and work on an addition to the hospital, to cost $20,000, will be commenced in the spring.

CANADA

To Curb Typhoid.—Lieut.-Col. Frederick W. Marlow, Toronto, has called a meeting of all the medical officers in the Toronto district to confer on the question of dealing with the outbreak of typhoid fever in the various surrounding districts.

Ontario Medical Meeting.—For the annual meeting of the Ontario Medical Association to be held in Toronto, May 30 to June 2, the program is well in hand. The address in medicine is to be delivered by Dr. Elliott P. Joslin, Boston, on the treatment of diabetes. There is to be a symposium on the rôle of the mouth, throat, nose and accessory sinuses in disease, and a meeting of military medical officers will also be held.

Returned Varsity Medical Students Dined.—After a year on active service, thirteen university medical students arrived in Toronto, January 18. They were members of the class of '17 and were dined by other members of the class and faculty that evening. They are home with the permission of the War Office to complete their course. They will return to the front as soon as they finish and receive lieutenantcies in the R. A. M. C. Prof. Archibald B. Macallum, Dean Charles K. Clarke and Prof. Alexander McPhedran were among the speakers.

Dr. Primrose at Saloniki.—Lieut.-Col. Alexander Primrose, chief surgeon to the University of Toronto Base Hospital at Saloniki, writing to Toronto, tells of surgery under peculiar difficulties. The operating tent is a large marquee floored and laid down with linoleum, and heated by oil stoves. It is 30 feet long. While often a driving sleet storm would be raging outside, they were able to operate as comfortably as in a modern hospital. The laboratory is well equipped and under direction of Dr. John J. Mackenzie, and associated with him are Drs. Duncan A. L. Graham and Cyril G. Imrie.

Summer Session at Toronto University.—From May 1 to November 30, fourth-year medical students at Toronto will be given a summer course to qualify for their degree, and there will be no fifth-year course next year at the university. This has been approved by the senate on the recommendation of the Faculty of Medicine. The summer session will last twenty-six weeks. There will be sixty men who will attend the summer session, and when they graduate they will be in a position to accept responsible positions with the various hospital units. It is understood that Queen's University, Kingston, will take a similar step.

Ontario Military Hospital, England.—Fuller particulars of the personnel of the medical staff of the Ontario Government Military Hospital, opened at Orpington, Kent, England, on January 19, are at hand. Lieut.-Col. Arthur E. Ross, Toronto, is to be the officer commanding. He has been on active service and was recently honored with C. M. G. Lieut.-Col. Irving H. Cameron, Toronto, professor of surgery in the University of Toronto, and who has been doing hospital work at Cliveden, is to be the surgeon-in-chief. Lieut.-Col. Graham Chambers, Toronto, who was recalled from Saloniki, is to be head of the medical service. Sir William Osler is to be consulting physician, Dr. Donald Armour, consulting surgeon, and Dr. George W. Badgerow, London, England, a former practitioner of Toronto, consulting specialist.

GENERAL

Sanitarians Meet.—The fourth annual meeting of the Southeastern Sanitary Association will be held in Brunswick, Ga., March 23 and 24, under the presidency of C. W. Oker, Hartsville, S. C. The vice presidents of the association are Drs. Ennion G. Williams, Richmond, Va.; James A. Hayne, Columbia, S. C., and Henry Hanson, Jacksonville, Fla. Dr. C. E. Smith, Greenville, S. C., is secretary of the association.

Impostor Captured.—Dr. Burnett W. Wright, Bowling Green, Ky., writes that C. L. or M. L. Mason, has, since October, been impersonating him in different parts of the country, that he has been securing money by false representations, and that in some instances he forged Dr. Wright's name to worthless papers. Mason is now under arrest and confined in the Warren County jail. A notice concerning his activities was published in THE JOURNAL, Dec. 4, 1915, p. 2018, under the title, "Impostor Swindling Physicians." Dr. Wright is anxious that victims, wherever located, assist in the prosecution by swearing out warrants and mailing them to the police authorities in Bowling Green, Ky.

Containers for Poisons to be Regulated.—Representative H. A. Barnhart of Indiana proposes, in a bill which he has introduced into congress "by request," that the manufacturer or packer of poisonous drugs be required to place on each bottle, can, tube, or the like, containing such drugs, a stopper or cap which in shape and inscription shall indicate the nature of the contents. The style and composition of the stopper or cap are to be prescribed by the Secretary of Agriculture. As the proposed legislation is in the nature of an amendment to the Federal Food and Drugs Act of June 30, 1906, it is applicable only to interstate commerce and to commerce in the District of Columbia and places under exclusively federal jurisdiction.

Organization of Clinical Laboratories.—A meeting will be held in Chicago, February 26, to form an organization of the leading clinical laboratories of the United States. The

objects stated are the adoption of standards of efficiency for clinical laboratories, the promotion and encouragement of the development of more exact methods of laboratory diagnosis, and the adoption of standards to which the work of such laboratories should conform. The question of standardization of commercial clinical laboratories is of decided importance to physicians, and of vital interest to the public. It is hoped that this organization may result in eliminating any unreliable laboratories which may exist, as well as in increasing the general efficiency of all laboratories.

Bequests and Donations.—The following bequests and donations have recently been announced:

The University of Maryland Hospital, $2,500, by the will of Dr. St. Clair Spruill, Baltimore.

An American Red Cross motor ambulance for European War service, donated by Mrs. W. L. Velie, Moline, Ill.

Pennsylvania Hospital, $5,000, for the maintenance of a free bed; Orthopedic Hospital, Philadelphia, $5,000, for a surgical ward, by the will of Louisa W. Anschutz.

For the establishment of the Henrietta Egleston Hospital, Atlanta, Ga., as a memorial to the mother of the testator, $100,000, for the purchase of a lot and the erection of a hospital building and an annuity of about $12,000 for maintenance, by the will of Thomas Egleston.

Cleveland Medical Library Association, $25,000, by the will of Dr. Benjamin L. Millikin, Cleveland.

Clarence Barker Memorial Hospital, Biltmore, N. C., $5,000, by the will of Mrs. Frances N. Wright.

National Standards for Milk and Cream.—Representative David J. Lewis of Maryland has introduced into congress a bill for securing and establishing uniform standards of testing the quality and condition of milk and cream moving in interstate shipments and intended for human food. The intimate relation of milk to human health has not seemed to Mr. Lewis sufficient to justify medical representation on the commission that is to fix the proposed standards, nor is he willing to take any chances on a woman having a voice in the matter. So the commission is to consist of three men, each of whom shall have had at least two years' practical dairy experience, one of whom is to be a bacteriologist, one a chemist, and one a practical dairyman. The proposed standards are to govern the quality and condition of all milk and cream moving in interstate commerce, the method of production and handling, the manner of inspection and the taking of tests, and the responsibility of shipper and consignee.

Medical Licensure: A New Method.—If you desire to practice medicine in any territory, district, dependency, or possession of the United States under the constitutional jurisdiction of congress, you may do so without any such trifling annoyance as an examination if you can comply with certain conditions prescribed by a bill recently introduced into congress—that is, if the bill passes. The privileges granted by the bill are available to:

> Any physician or surgeon who assisted, without compensation, in caring for the sick and wounded soldiers of the Army of the United States at the siege of Santiago, Cuba, in 1898, in the War with Spain, and who, after the surrender of Santiago, was in charge of a yellow-fever hospital, and while so in charge of said hospital in 1898 had an attack of yellow fever, and who was afterwards commissioned major and brigade surgeon, and in 1899 commanded a yellow-fever hospital at another station in Cuba, and who, while on military duty in Cuba, had a second attack of yellow fever, and who, by reason of said attack or attacks of yellow fever, or while in line of duty, was physically disabled, and who was honorably discharged from the service of the United States.

None others need apply.

Safety First Exposition.—From February 21 to 26, in the New National Museum at Washington was held a Safety First Exposition to demonstrate to the public what the government is doing to promote saving of life and property. Twenty-six bureaus of the government participated, the apparatus and methods used by each being exhibited and demonstrated by experts. The exposition was open from 9 to 4:30 daily. From the Department of Commerce five bureaus participated—standards, lighthouses, navigation, steamboat inspection service, and coast and geodetic survey. The Bureau of Medicine and Surgery of the Navy Department illustrated first aid in war and life-saving at sea. The Bureau of Mines demonstrated its mine rescue apparatus. The Bureau of Education, the Bureau of Labor Statistics, the Forest Service and the Children's Bureau were among the other exhibitors.

Fraudulent Canvassers and Collectors.—A notice which appeared in THE JOURNAL, Dec. 12, 1915, page 521, is reprinted below:

> **Fraudulent Canvassers and Collectors.**—We have repeatedly published warnings against fraudulent canvassers and collectors—sometimes in the Editorial department, sometimes in Queries and Minor Notes, and sometimes in News. In spite of these repeated warnings, some of our readers are still allowing themselves to be swindled. The scheme frequently followed is one that appeals to those who are ever ready to help a fellow mortal. A young man shows a printed blank indicating that he is a "contestant" for a prize in the form of a scholarship in an educational institution, to be awarded to the one who sends in the most business in a certain time. Again we suggest that those who would avoid being swindled should not pay money to traveling men whom they do not personally know. Checks should not be made payable to any person, but to the concern the person claims to represent; and even then one should be very sure that there actually is such a concern. Money should not be paid to any one claiming to represent the American Medical Association unless he carries credentials bearing the signature of the Editor and General Manager and the seal of the Association.

Under date of February 16, Dr. William Schulze, Monroe, La., wrote advising that THE JOURNAL's warning had put him on his guard. As he had been approached in a manner similar to that described in the foregoing warning, he wished to advise the Association that under the name of R. E. Douglass, "a man about 23 years old, well dressed" and with "quite a flow of good language" solicited subscriptions to THE JOURNAL of the American Medical Association and other medical journals, and that Douglass stated that he was "trying to earn a scholarship in the Georgetown University, Washington, D. C.; that every dollar would get him one vote." Dr. Schulze asked for credentials from the American Medical Association. The solicitor did not have them but did have a letter from the Publishers Association in the City of New York authorizing him to take subscriptions for any publication listed in a catalog he had with him, and that THE JOURNAL was listed in this catalog. Dr. Schulze did not fall a prey to the scheme and warned the physicians of Monroe to be on the lookout.

National Committee for Mental Hygiene Holds Annual Meeting.—The eighth annual meeting of the National Committee for Mental Hygiene, held February 2 in New York, was attended by a large group of distinguished alienists, social workers and philanthropists. Mr. Otto T. Bannard, the treasurer, announced that the Rockefeller Foundation had donated to the National Committee $22,800 for carrying on surveys of the care of the insane in sixteen states during the present year, supplementing gifts of Mrs. William K. Vanderbilt, Mrs. A. A. Anderson and Mr. Henry Phipps, which makes it possible for the committee to greatly extend its work.

The report of Mr. Clifford W. Beers, the secretary, showed the remarkable growth of the movement for conserving mental health and for improving the care of the insane and feebleminded. Societies for mental hygiene are now at work in eleven states. During the present year societies are to be organized in seven additional states. About twenty-five times as much is being expended on this sort of mental hygiene work as was spent in 1908 when the first society was founded.

Dr. Walter E. Fernald, superintendent of the State School for the Feebleminded of Waverly, Mass., presented a plan which had been adopted by the subcommittee on mental deficiency, of which he is chairman, for popular education, extensive surveys and researches in this subject. Dr. William L. Russell, White Plains, N. Y., medical superintendent of Bloomingdale Hospital, described how the work of the National Committee is conducted under the supervision of an executive committee, all experts in different fields of mental hygiene.

Dr. Thomas W. Salmon, New York, the medical director of the committee, gave an account of the surveys of the care of the insane which had been carried on during the year in South Carolina and in Texas and announced that similar studies, each conducted by expert alienists, are under way or about to be undertaken in California, Tennessee, Missouri, Illinois, North Dakota, Indiana and in the District of Columbia.

The following officers for the ensuing year were elected: Dr. Lewellys F. Barker, Baltimore, president; vice presidents, Dr. Charles W. Eliot and Dr. William H. Welch, Baltimore; treasurer, Otto T. Bannard; medical director, Dr. Thomas W. Salmon, New York; secretary, Clifford W. Beers; executive committee, Drs. August Hoch, chairman, New York, George Blumer, New Haven, Conn., Prof. Stephen P. Duggan, Drs William Mabon, New York, William L. Russell, White Plains, N. Y., and Lewellys F. Barker, Baltimore; finance committee, Prof. Russell H. Chittenden, chairman, Otto T. Bannard, Dr. Henry B. Favill, Chicago, and William J. Hoggson; committee on mental deficiency, Dr. Walter B. Fernald, chairman, Waverly, Mass.; Dr. L. Pierce Clark, New York, Prof. E. R. Johnstone, Dr. Charles S. Little, Thiells, N. Y., and Dr. Albert C. Rogers, Los Angeles.

FOREIGN

New German Medical Journal at Prague.—As successor to the *Prager med. Wochenschrift*, which suspended publication at the onset of the war, the *Aerztliche Nachrichten* has been founded as the organ of the German-Bohemian physicians. Dr. G. Pick of Aussig is the editor.

U. S. Collier Takes Medicine to Palestine.—Announcement was made, February 2, by the Central Jewish Relief Committee, New York, that arrangements had been made for the shipment of a cargo of medicine to Palestine by a United States collier, which was to sail February 15.

Convalescent Home for Physicians at Berka.—A villa with extensive grounds near a watering place has been purchased by the Leipzig League for this purpose. This association was organized years ago, it will be remembered, to promote the economic welfare of the medical men of Germany, and it has aided materially in improving conditions in contract practice, etc.

League for Sexual Ethics.—A German association has been founded among medical men and medical students for propaganda of the principle that sexual abstinence until marriage is the only true means for combating venereal disease. The members pay a semiannual fee of about 36 cents. Further details in regard to this new "Medizinerbund für Sexualethik" may be obtained from Dr. Röthig, Südstra. 9, Leipzig, Germany.

Issues of Obstetrical Journal Delayed.—The publishers of the *Journal of Obstetrics*, London, announce that there has been no issue of the journal since May on account of the scarcity of contributors, due to the great number of men who have placed their services at the disposal of the army. The publishers expect, however, to have four issues ready about the end of this month and after the 1915 issues are published the journal will appear quarterly during the continuance of the war.

Improvement in Sanitation.—Increased attention is being given to the improvement of sanitary conditions, the opening up of congested areas and better town planning, in Madras Presidency, South India, according to *Commerce Reports*. At an industrial exhibition in Madras during the holidays one of the interesting features was a model Indian village with houses open to the inspection of the large number of people who visited the fair. Clay models of towns built on good and bad plans and lectures on health topics served also to educate the people along town planning and sanitary lines.

Deaths in the Profession Abroad.—Santa Cruz, chief of the Ophthalmologic Institute at Madrid, the first public infirmary in Spain for treatment of affections of the eyes.——K. Rauchfuss of Petrograd, the leading Russian pediatrist, at an advanced age. He was director of two of the principal hospitals for children and was an international authority on hospital hygiene, children's surgery and orthopedics, and internal medicine. He was one of the first to get up circulars to distribute to mothers to aid them in raising their children. A compilation of a number of his circulars was published as long ago as in 1882 (in Russian).——A. Ibarguren, director of a large public hospital at Buenos Aires, contributor to medical periodicals and popular postgraduate lecturer, aged 43.

Workmen's Compensation Law.—The Colombian Congress has recently enacted a law, which has been published in the *Diario Oficial*, making obligatory compensation to workmen for accidental injuries incurred in the course of their work. The beneficiaries of the law comprise workmen engaged in public lighting plants, waterworks, railways and street cars, breweries and distilleries, match factories, building and masonry work where more than fifteen men are employed, mines and quarries, large boats, government works and manufacturing plants using mechanical power. Employers may have their employees insured to provide against accident obligations. The government has appropriated $500 for insuring employees during the first year of the operation of the law. Further details are given in *Commerce Reports*.

Yellow Fever.—The Report of the Department of Health of the Panama Canal for December, 1915, says that with the advent of the rainy season, yellow fever was again reported at Guayaquil, though the number of cases up to the time of the report had been small. In Buenaventura, Colombia, it was said that yellow fever conditions continued unsatisfactory, and that no apparent effort had been made to eradicate the disease. Travelers, it is said, reported that the infection extended throughout the country in the vicinity of Buenaventura. Reports in Buenaventura that the infection came from Panamá are denied by the health authorities of the Canal Zone. Two patients with yellow fever arrived at Balboa quarantine from Buenaventura, December 10. They were immediately isolated and the vessel on which they came was disinfected and held, with the personnel, in quarantine for six days. One patient died in the Ancon Hospital, December 14, and the other was discharged well.

One Hundred and Twenty-Fifth Anniversary of Netherlands Medical Society.—There are not many associations for the advancement of science that can look back on 125 years of continuous activity. The Amsterdam Genootschap ter Bevordering van Natuur-, Genees- en Heelkunde was founded in 1790, and at its recent one hundred and twenty-fifth annual meeting Dr. C. C. Delprat reviewed its history and achievements. As its name implies, Association for Nature Study, Medical Art and Medical Science, medicine always took the leading place in its transactions, and it has a noteworthy history in this line. Delprat's address is published in the opening number of the *Nederlandsch Tijdschrift voor Geneeskunde* for 1916, which begins the sixtieth year of our exchange. It is accompanied by a dozen engravings showing the amphitheater for teaching of anatomy, 1690; lecture room, 1760; hospital, 1763, and a number of early officers of the society. The gala meeting was presided over by Prof. G. van Rijnberk, who is also editor of the *Tijdschrift*. The society awards the Swammerdam medal every tenth year. The four recipients to date have been the Germans, Siebold, Haeckel and Gegenbaur, and the Netherlands scientist, Hugo de Vries. The Tilanus medal has been awarded every five years since the death of this eminent surgeon. It is given for the best work on some surgical or medical subject, and has been awarded to Zwaardemaker, C. de Mooy, L. Bolk and J. Boeke, all of the Netherlands. The society also distributes some stipends to medical students for study abroad, and has officially contributed to a number of endowment funds in honor of various foreign scientists. On the occasion of the International Medical Congress, meeting at Amsterdam in 1879, seventeen of the foreign scientists attending the congress were elected honorary members of the association. When first organized, the Genootschap was exclusively medical, and a photograph of the first formal certificate of membership is reproduced. It is dated 1790.

WAR NOTES

Drug Store Supplies in Germany.—A Berlin exchange states that pill and powder boxes and glass containers have had the price raised by 5 pfennige each. The last official price list of pharmacists' supplies includes, for the first time, antimeningitis serum, but no price is specified for benzin, English chloroform, English oil of peppermint, English atrop. sulf., hydrochloric. solut., petroleum, and hen's eggs. These have been dropped from the official *Arzneitaxe*.

Polish and Flemish Universities Planned.—The German authorities have transformed the Russian university at Warsaw into a Polish institution, with Poles as incumbents of the various chairs. It is now planned to transform the University at Ghent, in the same way, into a Flemish institution, instead of the French language being used. This university dates from 1816, and in 1913 had 1,253 matriculants, including 272 foreigners. Among the better known professors then were von Ermengem, J. F. Heymans and C. Verstraeten.

Welfare Work for Maimed Soldiers.—All the belligerents are organizing on an extensive scale and coordinating the efforts to "uncripple the cripples," supply artificial limbs and train in the use of them, and combat in every way the tendency to deformity and disability. Foreign journals teem with illustrated articles showing constantly improving protheses and functional adaptation of the wounded. The German Orthopedic Society called a special meeting at Berlin early in February, the main subjects discussed, outside of protheses, being treatment and after-management of wounds of nerves and after-treatment of deformed healing of fractures, contractures and ankylosis and of the secondary functional disturbances after injury of peripheral nerves. An exhibition of artificial limbs, from those with merely historic interest to the latest improved devices, supplemented the gathering, and it was preceded by a special meeting of the association formed for surveillance and coordination of all institutions and efforts to aid the war cripples. Biesalski reviewed what it has accomplished in the year of its existence, and the share of medical men in the work. Others

discussed the subject from the standpoint of agriculture, clerking, teaching, etc. The French military authorities provided from the first orthopedic central stations at numerous points to which the wounded were referred. The necessity for combining neurology and physiotherapy with orthopedic surgery was recognized early, so that these central stations were usually blended together. Reports of the year's work done in such institutions in 1915 are now being published in France and Germany—wonderful records of human ingenuity and perseverance.

LONDON LETTER

LONDON, Feb. 1, 1916.

The War

THE ENROLMENT OF PHYSICIANS FOR THE ARMY

The enrolment of physicians in civil practice for the army continues *pari passu* with that of the civil population. It is being organized by the Central Medical War Committee. This body was originated by the British Medical Association, but includes members who do not belong to the association, and is working with the consent and authority of the director general of the Army Medical Service. The committee is recognized by him as the medium for providing physicians needed by the War Office for the army, and at the same time protecting the needs of the civil population. The committee has sent a letter to every physician of military age, confidently appealing to him to enroll for service. It hopes to obtain every one of that age (that is, up to 45), so that further calls by the director general of the Army Medical Service may be promptly met, with due regard to the necessity of the services to the needs of the civilian population, and to the circumstances of individual medical practitioners. It is pointed out that unless all are enrolled, it will be very difficult for the Central Medical War Committee to make its calls throughout England and Wales in a manner which will minimize the inconvenience suffered both by the community and by individual physicians. The enrolment of all physicians of military age does not mean that all enrolled will be called on to take a commission. The number called on will depend entirely on the demands of the services. The calls will be made in consultation with local committees, which will insure due regard for local needs. The committee trusts also that those who are not able, or are not required, to undertake military service will, so far as opportunity offers and their ability permits, contribute to the military strength of the country by placing their services at the disposal of the local medical war committees for the purpose of arrangements that may be necessary for the conservation of the practices of men of military age to enable them more easily to enroll.

THE SUPPLY OF PHYSICIANS

While the shortage of physicians must continue as long as men are drawn in large numbers from civil practice by the army, the threatened shortage of the future, due to the recruiting of medical students (previously described in THE JOURNAL) does not appear to be such a danger as was anticipated. Some figures recently issued by the General Medical Council are a surprise. The number of physicians registered in 1915 is greatly in excess of the average of the previous five years. The numbers are: England, 863; Scotland, 412, and Ireland 251. The averages for the previous five years are, respectively, 591, 384 and 197. The total for 1915 is 1,526, against an average of 1,172 for the previous five years. The number of medical students registered in 1915 also shows a great increase. The figures are: England, 754; Scotland, 694, and Ireland, 470. The averages for the previous five years were, respectively, 620, 517 and 304. Thus the total number of registered medical students in 1915 was 1,918, against an average of 1,441 in the previous five years. The increased number of physicians registered in England in 1915 is mainly due to the registration of physicians with colonial and foreign qualifications, which has been permitted since the war. These amount to 269. In Ireland and Scotland the excess seems to be due to the earlier qualification of fifth year students anxious to join the army. This is borne out by the fact that last year there was a shortage in the schools of from 200 to 300 fifth year students. Again, the policy adopted by the War Office, on the advice of the medical authorities, of requiring medical students who had enlisted in various capacities to return to their schools in order to qualify seems to be the chief cause why the expected shortage has been replaced by an actual increase. It is thought that the return of the fourth year students from the ranks will tell in the present year in a similar way. The rise in the number of medical students is probably largely due to the increased incomes obtainable by the rank and file of the profession from practice among the working classes since the passing of the insurance act—an increase which has reacted on the salaries offered to young physicians by hospitals, public bodies and shipping companies. This condition has been described in previous letters. Another cause of the increase is the greater number of women students who have entered the profession.

BERLIN LETTER

BERLIN, Jan. 19, 1916.

Personal

DEATH OF KÜLPE

Oswald Külpe, professor of philosophy and psychology, died in Munich, Dec. 31, 1915, at the age of 53. Although not a member of the medical faculty, much of Külpe's research work was done in medical subjects, and his results were of value not only for psychology but also for psychiatry. He was one of the most thorough investigators in experimental psychology and psychophysics. He was a master of technic; at the same time he was a keen thinker and well versed in theoretic and metaphysical problems. In 1887 he graduated in Leipzig as a pupil of Wundt's. His thesis was entitled "The Theory of Psychic Sensations," and in the following year he won for himself a place in the philosophical faculty by writing on "The Study of the Will in Newer Psychology." In 1894 he was made extraordinary professor, and in the fall of the same year he was called to Würzburg as ordinary professor. During the summer of 1909 he went to Bonn, and in October, 1913, he was called to Munich. Here he assisted in the direction of the philosophical seminary and the newly-erected institute for psychology. In 1907, the medical faculty of Giessen conferred on him the honorary doctor's degree in recognition of his researches in experimental psychology. It will be remembered that Sommer was then a member of the Giessen faculty, and, like Külpe, he was very much interested in experimental psychology. In his original researches Külpe was influenced very much by Wundt, but later on came out more strongly all the time for the dual theory. He regarded the problem of reality as the essential one in philosophy. He wrote much. Among his better-known writings may be mentioned his "Essentials of Psychology from the Experimental Standpoint," and his "Introductions to Philosophy" as well as his more popular writing "The Philosophy of the Present" and his monograph on "Immanuel Kant."

DEATH OF KLAATSCH

January 7, Prof. H. Klaatsch, one of the younger anthropologists, died in Breslau, at the age of 52. During his last semester as a student, he was made assistant to Waldeyer, and in 1888 he was appointed assistant at the Heidelberg anatomical institute. In 1895 he was appointed extraordinary professor. Since 1907 he has occupied a similar position in Breslau. Prior to that time he had made a very extended study of the aborigines of Australia. He learned that these people were closely related to the Asiatic-European races. Of his researches in anatomy may be mentioned those on the morphology of the tactile bodies in the feet of the marsupials which led him to a further study of the phylogenetic significance of the lines in the hand of the human. He was also interested in the study of fish anatomy, the morphology of the fish scales, as well as the anatomy and embryology of the spinal column. Prominent among his anthropologic researches are those made in collaboration with Dr. Hauser, who published the finding of the *Homo aurignaciensis* in the Dordogne. Klaatsch made the anthropologic study of the skeleton, and definitely established the direct descent of man of the present day from man of the stone age. Klaatsch advanced Darwin's theory of the descent of man by his paleontologic findings. He also studied the Neanderthal skull, and on the basis of his findings concluded that it resembled in construction the gorilla, and therefore was probably descended from anthropoid ancestors who came from Europe to the East, whereas the Auvignac race, which resemble the orang, probably are descended from a further east stem. The man apes of today bear a very strong resemblance in development to the original human stem.

DEATH OF FRIEDRICH

Professor Friedrich, the well-known surgeon, died from sepsis, January 16, after many weeks of illness. He was

only 51 years of age, but had attained considerable prominence. He passed his examinations in 1888, and immediately was appointed assistant in the bacteriologic division of the imperial health department. In 1891 he removed to the surgical clinic in Leipzig, and in 1896 he was appointed extraordinary professor and director of the surgical policlinic institute. From there he went to Greifswald, and in 1907 he went to Marburg. In 1911 he was called to Königsberg. Some of his valuable contributions to science were his study of the cholera and tubercle bacillus, the surgical treatment of the epileptic and of pulmonary tuberculosis and emphysema. His work on the digestive tract is also well known.

The War

SANITATION IN EAST PRUSSIA DURING THE WAR

The report made by the chief of the division of medicine of the Prussian ministry to the director of the interior, Kirchner, several weeks ago, dealing with the sanitary development of East Prussia, contains points of interest to American physicians. Kirchner visited those parts of East Prussia in which war had been waged, and where the occupation by the Russians played havoc with the usual sanitary regulations in order to determine just how much damage had been done and how much could be repaired. He traveled through the country of the Masurian lakes because of the reports that many thousands of Russians and their horses had been driven into these seas during the battle of Tannenberg and died either as a result of drowning or of shooting. Naturally, if this were true, the health of the people living in the surrounding country would be endangered because of the dead bodies of men and animals which would come to the surface and undergo putrefaction, although such reports could well have been regarded as untrue because these Masurian lakes are many miles east of the Tannenberg battlefield. The official investigations made by the authorities within the sphere of the Tannenberg battlefield show that neither men nor horses were driven into these waters and surely not thousands of them. This is another illustration of the fantastic statements that have been made and which cast discredit on all concerned.

Another subject to be mentioned in this connection is the reported mistreatment of women in the war zone. Official investigation has shown that in East Prussia there were only thirty-eight cases of pregnancy for which Russians could be held responsible. No definite proof of so-called assault could be obtained.

THE MEDICAL TREATMENT OF THE FAMILIES OF THOSE PARTICIPATING IN THE WAR

The city of Berlin has published the following resolutions:

1. The city of Berlin has appropriated 500,000 marks ($125,000) for the medical treatment of the families of those participating in the war for the year beginning Jan. 15, 1916. The council of the *Aerztekammer* (chamber of physicians) receives a monthly remittance and distributes the money to those physicians who have been active in the treatment of such persons named.

2. The city of Berlin has been divided into twenty-three medical districts, and will take care of the families of those in the war who are receiving support from the government, but are not members of any sickness insurance. The physicians and specialists living in these districts will be assigned to the work, provided that they will subscribe to certain regulations. If they are assigned to visit a family which is already receiving medical attention, then the government physician may allow the family physician to continue his ministrations. These physicians must agree to see these patients during their usual office hours, or in the home of the patient whenever necessary. Special treatment will be given only on recommendation of the general practitioner. The *Aerztekammer* will ask all physicians practicing in Berlin to take part in this work, and will furnish the magistrate with a list of those who agree to do so. These regulations will be in force only from Jan. 15, 1916, to April 15, 1916, and any desire on the part of the physicians to discontinue such service must be made known at least four weeks before the expiration of this three months' period. If this is not done, then the contract will continue for another period of three months until such time as the public authorities withdraw their support from the whole scheme. It is stated specifically that the appropriation of 500,000 marks need not necessarily be expended, but only such portion of it as is needed for the continuance of this work. The physicians' bills are sent to the *Aerztekammer*, whose officials will audit and approve, if correct, then remitting directly to the practitioner.

PARIS LETTER

PARIS, Jan. 27, 1916.

Personal

January 11, the Académie de médecine elected as foreign correspondents in the section of medicine Professor Ladame of Geneva and Sir Dyce Duckworth of London.

Death of Prof. Edmond Heckel

Edmond Heckel, professor in the Faculté des sciences de Marseille and professor of materia medica in the Ecole de médecine de Marseille, has just died at Marseilles, aged 73. Professor Heckel had published, in particular an "Histoire médicale et pharmaceutique" of the principal medicinal substances introduced into therapeutics in recent years, as well as numerous memoirs on caffeine, kola, etc. He had been a national correspondent of the Académie de médecine for the section on medical physics and chemistry since 1880.

An Offense Against Public Health Committed by a Mayor

M. Mirman, the prefect of the department of Meurthe-et-Moselle, has just suspended the mayor of Rosières-aux-Salines from his functions for fifteen days. The mayor posted a notice informing the populace that the person responsible for the removal of the troops from the commune was the cantonal physician. The prefect of Meurthe-et-Moselle believes that the mayor committed a grave offense when, instead of explaining to the inhabitants of the commune the necessity of a measure for the protection of the public health, he endeavored to excite their resentment against a physician who had simply performed his duty, and who would have been subject to penalties if he had sought to evade it.

The War

TREATMENT OF SETON WOUNDS

Dr. Tuffier, at a recent meeting of the Société de chirurgie de Paris, advised the systematic introduction into seton wounds of a drain for irrigation and disinfection by Dakin's fluid. Dr. Broca showed, by personal statistics, that more than three fourths of these seton wounds healed without other treatment than applications of aseptic dressings at the orifices of entry. Continual irrigation of Dakin's fluid therefore has no advantage in such cases; on the contrary, it has disadvantages, for in seton wounds which contain débris of clothing, with or without bone fragments, Tuffier himself admits that irrigation with Dakin's fluid is inefficacious. In these cases the only course to pursue is to open up freely on the appearance of the first signs of inflammation.

CRANIAL PROTHESIS WITH PERFORATED IVORY PLAQUES

To supply the loss of skull substance due to trephining, plaques of gold are often used. At a recent session of the Société de chirurgie de Paris, Dr. Mauclaire presented two patients on whom, for the same purpose, he had used plaques of perforated ivory which, at the end of six or eight weeks respectively, are still well tolerated. The advantage of these ivory plaques is that they may be made in advance. The edges being very thin, the plaques can be cut down a little if they are too large. It is unnecessary to fasten them with pegs, or to insert the anterior or posterior edges under the skull, for cellular tissue rapidly penetrates the perforations. These plaques are very cheap.

CERVICAL RHEUMATISM AND SCIATIC NEURALGIA ASSOCIATED IN SOLDIERS

Dr. P. Nobécourt has observed some soldiers affected with cervical rheumatism who, in most cases, also suffer from sciatic neuralgia. In these latter cases the association of the pains in the nape of the neck with those of the limbs forms a well-defined syndrome. The onset of the attack, which may be preceded by prodromal symptoms, is, in general, sudden and rapid and in most cases appears to be produced by a march, by severe labor, by exposure to rain or by a night passed in damp quarters. Of all the symptoms observed (elevation of temperature and acceleration of pulse, slight hypertrophy of the spleen, habitual constipation, headache, especially frontal, pain in the nape of the neck, etc.), pain in the nape of the neck is the most characteristic. It is not very intense except when it is produced by movements of the neck, which thus becomes almost completely immobilized. The head may still be bent forward on the chest, however, without pain. Palpation of the neck localizes the painful points, which are situated in general in the posterolateral

regions of the neck near the transverse vertebral processes. In the legs, examination shows, in general at least, light signs of sciatica. Pressure on the eyeball is sometimes painful. Lumbar puncture withdraws under more or less pressure a clear cerebrospinal fluid in which albumin is ordinarily increased, nearly always to a marked degree. In these cases the vertebral rheumatism and sciatic neuralgia yield rapidly under treatment with aspirin or sodium salicylate, and the patient recovers in a few days unless cardiac complications occur. The meningeal reaction indicated by the changes in the cerebrospinal fluid sometimes leads to a suspicion of cerebrospinal meningitis. Methodical examination of the patients, however, brings out the true diagnosis. In these cases the symptoms of cervical arthropathy and neuralgia dominate, while those which characterize meningitis (stiffness of the nape of the neck, Kernig's sign) are missing or are diminished. Lumbar puncture removes all doubts. It should be performed without hesitation, especially since it frequently makes the patient more comfortable.

MEASURES AGAINST FRAUDS IN FOOD ON THE ARMY FRONT

M. Justin Godart, the assistant secretary for the military medical service has recently decided, in order to prevent frauds on the part of dealers, to authorize the military pharmacists to exercise careful control over all the foodstuffs for the use of the soldiers and to make any examination or analysis which may appear worth while.

HOSPITAL ACCOMMODATIONS IN SWITZERLAND FOR PRISONERS OF WAR

I recently mentioned (The Journal, Feb. 12, 1916, p. 522) that the negotiations with regard to the placing of the sick prisoners of war in the hospitals of Switzerland were about completed. Preparations are already being made at Leysin to receive the first French prisoners from Germany. These are patients affected with pulmonary tuberculosis and tuberculosis of the bones (Pott's disease, coxalgia, etc.). The pulmonary patients will be cared for in the higher part of the resort, which is reserved for such patients. The others will be cared for in Leysin village, in special clinics for heliotherapy, under the direction of Dr. Rollier. The private soldiers will be lodged in groups, each under the command of an officer or noncommissioned officer. The pay given by the French government (5 francs [$1] for a private soldier, and 8 francs [$1.60] for an officer) permit the hotel keepers to give their guests healthful and abundant food.

ADVICE FOR THE PRESERVATION OF THE SOLDIER'S HEALTH

The war department, through the assistant secretary for the military medical service, has been distributing to our soldiers at the front a little brochure entitled "Conseils au soldat pour sa santé" which contains useful hints as to personal cleanliness, measures for protection against insects, cold, frost bite and complications as well as against asphyxiating gas.

AID FOR DISCHARGED TUBERCULOUS SOLDIERS

The municipal council of Paris has just requested the prefect of the department of the Seine to prepare, as soon as possible, a plan for building barracks for the isolation and treatment of tuberculous patients on the available land of the hospitals of Paris. The barracks are to accommodate 2,500 beds.

SLEDGES FOR THE TRANSPORTATION OF THE WOUNDED

A subscription from the members of the Swiss colony in Paris has resulted in the gift to the medical service of the French army of 100 sledges for the transportation of our wounded soldiers in the Vosges. Each one bears a copper plaque ornamented with the symbolic figure of Helvetia, surrounded with edelweiss.

MALINGERING

I mentioned in a previous letter cases of phlegmons artificially produced by injection of coal oil (The Journal, Dec. 4, 1915, p. 2021). Dr. Laval has just made an interesting report on this subject to the Société de chirurgie de Paris. These abscesses are usually seen in a special class of soldiers, especially those who have undergone punishment or have come in contact with such men. These malingerers take care to devise a plausible explanation for the lesion. Some make an injection on the site of an old lesion or wound; others offer blows, falls, stumbles or wounds by barbed wire as the cause of the inflammation. Still others, afraid of being entrapped, say nothing until pressed for an explanation, when they break down and confess. According to the confessions, the instrument used is the ordinary morphin syringe which may be obtained at any drug store. The contents are injected into the subcutaneous cellular tissue at one injection or in several places in the same vicinity. Laval has seen coal oil abscesses on the legs, on the forearm, on the hand (never on the upper arm), and most frequently on the inner side of the knee joint. The exterior appearance of the abscess is typical. It is that of a tumefied phlegmon, often extending over a surface the size of the palm of the hand with here and there phlyctenae with purulent contents. The tumefaction is often sharply circumscribed like the swelling of erysipelas. Sometimes one may observe little grayish points, which are the traces of the puncture where the injection was made. The fluctuation appears on the fourth or fifth day. It is very easily observed and is characteristic of the infection. Incision lets out more or less abundant pus mixed with clots and with black fluid blood. Trabeculae divide the interior of the abscess. The odor of coal oil is noticeable when an abscess is opened but the liquid itself exposed to the air rapidly loses the odor. Sometimes the pus has no odor, but a compress introduced into the lesion and rubbed against the sphacelated walls absorbs the odor to a marked degree. There are special peculiarities in the course of these cases. The abscesses are very slowly cleansed, the process lasting for several weeks, and new cutaneous and conjunctival necroses often occur if the injection was deep. Fragments of muscle and tendon are eliminated. Secondary local infections and sometimes septicemia are produced by these eliminating suppurations. Laval had to amputate in one case. The appearance of the lesions, the mingling of phlegmonous and gangrenous processes and the odor of the pus are the characteristic features of abscesses caused by injections of coal oil. Laval mentions a special chemical reaction devised by Theuvenot, pharmacist of the hospital of Neufchâteau. Three test tubes are half filled with a very weak bromin solution of a strength showing a yellow like that of a yellow chartreuse wine. In the first is placed 1 c.c. of suspected pus. If it contains coal oil, decoloration takes place almost immediately, the fluid assuming a clear gray color and the pus accumulating at the bottom of the tube in gray flakes. The second tube is a blank and the third receives 1 c.c. of pus from an ordinary abscess. In this there is no discoloration.

Dr. Savariaud emphasizes the fact that in phlegmons caused by injection of coal oil the multiplicity of foci is not due to the number of punctures, and that diffusion may be due to the injection of a very heavy dose. This feature is characteristic of this kind of phlegmon, for there is no other way in which many phlegmonous and gangrenous lesions can be produced without any visible point of introduction of the injurious substance.

I also mentioned in a previous letter the simulation of albuminuria (The Journal, Nov. 27, 1915, p. 1930). Dr. Minet has also called the attention of the Société médicale des hôpitaux de Paris to this subject. Fraud (that is, injection of albumin into the bladder by way of the urethra) may be suspected when, if the subject urinates twice with a certain interval between the two micturitions, there is a considerable lowering of the albumin percentage or albumin is entirely absent in the second glass. This procedure, however, is not absolute proof. To avoid all chance of error Minet advises that the second glass of urine be obtained by a catheter left in place for some time under surveillance.

Marriages

Hiram Leonard Johnson, M.D., Franconia, N. H., to Sarah Elizabeth Coppinger, M.D., Needham Heights, Mass., in Boston, February 8.

Laurance Phillips Runyon, M.D., to Miss Katherine McClelland Neilson, both of New Brunswick, N. J., February 9.

Henry Rihl Alburger, M.D., to Miss May M. Littlefield, both of Indianapolis, February 3.

James A. Campbell, M.D., Elgin, Ill., to Miss Ruby Dale, at Los Angeles, February 3.

Leo Matthew Czaja, M.D., to Miss Julie Belohavek, both of Chicago, February 15.

Deaths

Henry Baird Favill, M.D. Chicago; Rush Medical College, 1883; aged 55; one of the best known physicians of Chicago; died in Springfield, Mass., February 20, from pneumonia.

Dr. Favill was born in Madison, Wis., Aug. 14, 1860. He graduated at the University of Wisconsin in 1880, and then entered Rush Medical College, from which he graduated three years later. He practiced in Madison until 1893, when he was induced to come to Chicago.

Soon after his arrival in Chicago he was made professor of medicine in the Chicago Polyclinic; in 1898, professor of therapeutics, and later professor of clinical medicine in Rush Medical College.

In 1910 at the St. Louis meeting of the American Medical Association he became a member and chairman of the Council on Health and Public Instruction and filled that position to the time of his death. He was president of the Chicago Medical Society in 1907-1908. Besides his affiliation with the American Medical Association he was a member of the Chicago Pathological Society, Chicago Institute of Medicine, Physicians' Club of Chicago and many other scientific and social bodies. Until 1913 he was president of the Chicago Tuberculosis Institute. He had also been an officer of the National Society for Mental Hygiene, Chicago Association of Commerce, United Charities of Chicago, National Dairy Council and Holstein-Friesian Association. He was president of the latter association at the time of his death. He was attending physician to St. Luke's, Passavant Memorial and Augustana hospitals. For three years he was president of the Municipal Voters' League of Chicago.

Dr. Favill did not limit his interests to medicine, but early took up the consideration of civic problems. He was an able champion of good government, clean politics, municipal improvement and sanitary progress. He was made a director of the City Club of Chicago the year after its organization and became its president in 1911, and at the time of his death he was a trustee of the Chicago Bureau of Public Efficiency.

Dr. Favill was proud of his Indian blood, which he traced back to Kewinoquot, a chief of the Ottawa tribe. He was a man of superb physique and exuberant vitality and an unlimited capacity for work. Three weeks before his death Dr. Favill presided at a meeting of the Physicians' Club of Chicago at which the topic of discussion was "Longevity." Pneumonia was there said to be one of the principal opponents of the efforts of the medical profession to prolong life. Soon after Dr. Favill was called to attend Mr. John J. Herrick, a prominent lawyer of Chicago and son of Dr. William B. Herrick, one of the pioneer practitioners of the city. Mr. Herrick was ill with pneumonia and died. Dr. Favill attended his funeral. The law partner of Mr. Herrick, Mr. Charles L. Allen, son of Dr. James Adams Allen, formerly president of Rush Medical College, attended the funeral of Mr. Herrick, caught cold, pneumonia supervened and in spite of all efforts made by Dr. Favill, succumbed to the disease. Dr. Favill attended Mr. Allen's funeral.

Dr. Favill went to Springfield, Mass., early last week to deliver an address before the New England Dairymen's Convention on behalf of the National Dairy Council of which he was president, but was prevented by illness.

HENRY BAIRD FAVILL, M.D., 1860-1916

Dr. Favill was a man of strong personality, a friend of sterling quality, a modern St. Michael in fighting the dragons of inefficiency, corruption and wrong. The tribute of one friend expresses well the characteristics of Dr. Favill: "He was interested efficiently in more activities outside of his profession than any other physician in the country."

Henry Leopold Elsner, M.D., Syracuse, N. Y.; College of Physicians and Surgeons in the City of New York, 1877; aged 60. He was a Fellow of the American Medical Association, and of the New York Academy of Medicine; a member of the American Gastroenterological Association and American Climatological Association and formerly president of the Medical Society of the State of New York; Onondaga Medical Society, Central New York Medical Association and Syracuse Academy of Medicine. He was a member of the faculty of the Department of Medicine of Syracuse University since 1881 and later, to the time of his death, professor of medicine of that institution; he served also as consulting physician to St. Joseph's Hospital, the State Hospital for Crippled and Deformed Children and the Women's and Children's Hospital, Syracuse. Dr. Leopold Elsner, father of Dr. Henry L. Elsner, and Dr. Simon Elsner of Rochester, N. Y., a brother, died suddenly a few years ago. Just previous to Dr. Elsner's death he had completed a book on prognosis which had occupied his time largely during the last few years. He was noted as a teacher and was frequently called in consultation throughout the country. At the time of his death Dr. Elsner was in Washington, D. C., where he had taken up temporary residence in order to obtain rest from his numerous duties. He contracted a severe cold, from which he was unable to rally, and died suddenly, February 17.

George Dwight Kahlo, M.D., White Sulphur Springs, W. Va.; Bellevue Hospital Medical College, 1891; aged 51; a Fellow of the American Medical Association; president of the Indiana State Medical Association in 1909; secretary to the United States consul at Sydney, Australia, in 1881; once police surgeon of Indianapolis; for several years professor of the practice of medicine and dean of the Central College of Physicians and Surgeons, Indianapolis; and later professor of clinical medicine in the Indiana University School of Medicine; from 1908 to 1912 medical director of the French Lick Springs Sanatorium, and since that time medical director of White Sulphur Springs, W. Va.; died suddenly at Old Point Comfort, Va., February 12, from cerebral hemorrhage.

William Edward Moseley, M.D., Baltimore; Harvard Medical School, 1874; aged 67; a Fellow of the American Medical Association, American Gynecological Society and American College of Surgeons; president of the Gynecological and Obstetrical Society of Baltimore and of the Alumni Association of the Women's Hospital in the State of New York; professor of diseases of women and children in the Baltimore Medical College from 1897 to 1910, and gynecologist to the Union Protestant Infirmary, Baltimore; died at his home, February 10, from carcinoma.

Edgar David Coonley, M.D., Port Richmond, Staten Island, N. Y.; College of Physicians and Surgeons in the City of New York, 1877; aged 71; a member of the Medical Society of the State of New York; formerly president of the Richmond County (N. Y.) Medical Society; a veteran of the Civil War; consulting surgeon to the S. R. Smith Infirmary,

Port Richmond, and at one time a member of the board of education; died at his home, February 8, from heart disease.

James Lloyd Wellington, M.D., Swansea, Mass.; Harvard Medical School, 1842; aged 98; a member of the Massachusetts Medical Society; believed to have been the oldest alumnus of Harvard Medical School and the oldest male resident of Massachusetts; for sixty-two years a practitioner of Swansea; assistant surgeon of the Seventh Massachusetts Infantry from 1840 to 1842; for one term a member of the Swansea school board; died at his home, February 11.

Ralph Clark Apted, M.D., Grand Rapids, Mich.; University of Michigan, Ann Arbor, 1902; aged 39; a Fellow of the American Medical Association and a member of the Association of Military Surgeons of the United States; ranking major-surgeon in the Medical Corps of the Michigan National Guard; city physician of Grand Rapids for eleven years; a veteran of the Spanish-American War; died at his home, February 13, from carcinoma of the pancreas.

Albert W. Fisher, M.D., Toledo, Ohio; Jefferson Medical College, 1860; aged 80; a member of the Ohio State Medical Association; surgeon of the Fifty-Seventh Pennsylvania Volunteer Infantry during the Civil War; for several years health officer of Toledo; formerly physician to the United States Marine Hospital, Toledo, and surgeon of the port of Toledo; died at his home, February 4, from bronchopneumonia.

Emanuel Oscar Stuckey, M.D., Albuquerque, N. M.; University of Nashville, Tenn., 1903; aged 47; formerly of Atlanta, Ga., and later assistant physician at the Valmora Sanatorium, Watrous, N. M.; while suffering from despondency on account of tuberculosis, died February 3, in his apartment, from the effects of poison, believed to have been self-administered with suicidal intent.

Edward Everett French, M.D., Bentleyville, Pa.; Jefferson Medical College, 1887; aged 50; a member of the Medical Society of the State of Pennsylvania; secretary of the Ellsworth Board of Health; president of the First National Bank of Bentleyville; a practitioner and pharmacist; died in the Suburban General Hospital, Belleview, Pa., February 10.

George Henry Schwinn, M.D., Washington, D. C.; Columbian University, Washington, D. C., 1898; aged 42; a member of the Washington Society of Nervous and Mental Diseases; first assistant physician at the Government Hospital for the Insane, Washington, D. C., and a member of the staff of the institution since 1898; died in his apartments at the hospital, February 6.

Arthur Eugene Evans, M.D., Columbus, Ohio; Miami Medical College, Cincinnati, 1882; aged 59; a Fellow of the American Medical Association; for ten years a member and once president of the city council of Columbus; once a member of the board of health and city physician; died at his home, February 7, from carcinoma of the throat.

Arthur R. Russell, M.D., Hamler, Ohio; Eclectic Medical Institute, Cincinnati, 1898; aged 42; local surgeon of the D. T. and I. Railway; for eight years mayor of Hamler; died at his home, December 12, from the effects of a gunshot wound, self-inflicted, it is believed, with suicidal intent while mentally unbalanced on account of overwork.

Leonard L. Bennett, M.D., Owatonna, Minn.; Rush Medical College, 1862; aged 76; a practitioner and president of the National Farmers' Bank of Owatonna, for four years coroner of Steele County and for many years a member of the board of county commissioners and school board; died at his home, February 3, from pneumonia.

Henry Clay Bostwick, M.D., Vancouver, Wash.; Rush Medical College, 1874; aged 84; a pioneer practitioner and druggist of Chehalis and Tacoma, Wash.; major-surgeon of the Ninth Kansas Volunteer Cavalry during the Civil War; for nearly twenty years a resident of Vancouver; died at his home, February 1.

Henry Ward Gregory, M.D., West Philadelphia; Medico-Chirurgical College of Philadelphia, 1899; aged 43; a Fellow of the American Medical Association; formerly a member of the staff of the Hazleton (Pa.) State Hospital; for fifteen years a practitioner of West Philadelphia; died at his home, February 11.

Jacob Stewart Martin (license, Indiana, years of practice, 1897), aged 82; for fifty-one years a practitioner of Rolling Prairie, Ind.; died at the home of his son in South Bend, Ind., January 30, from pneumonia.

Obadiah Hendricks, M.D., Macon, Miss.; Tulane University, New Orleans, 1853; aged 94; said to have been the oldest alumnus of Tulane; an honorary member of the Lauderdale County (Miss.) Medical Society; died at the home of his daughter in Meridian, Miss., about February 7.

Lewis A. Davis, M.D., Berea, Ky.; St. Louis College of Physicians and Surgeons, 1899; aged 41; a member of the Kentucky State Medical Association; local surgeon at Berea for the Louisville and Nashville Railroad, and city health officer; died at his home, February 4, from pneumonia.

Elisha C. Etchison, M.D., Gaithersburg, Md.; University of Maryland, Baltimore, 1874; aged 68; a member of the Medical and Chirurgical Faculty of Maryland; once representative in the legislature from Montgomery County; died in a hospital in Washington, February 5.

James E. Bumstead, M.D., Dundee, Ill.; Northwestern University Medical School, Chicago, 1880; aged 67; a practitioner of Dundee since his graduation and one of the most beloved practitioners of Kane County; died at his home, February 15, from pneumonia.

Phares James Dukeshire, M.D., Brooklyn; Long Island College Hospital, Brooklyn, 1909; aged 29; an official of the Brooklyn Board of Health and adjunct physician to the Polhemus Clinic; died at his home, February 8, from pneumonia.

Charles William Watt, M.D. Long Island College Hospital, Brooklyn, 1883; aged 56; for a long time surgeon for the A. S. and R. Railroad at Chihuahua, Mexico; died in Providence Hospital, El Paso, Texas, January 1, from pneumonia.

Thomas J. Wells, M.D., Davis, Okla.; Eclectic Medical Institute, Cincinnati, 1890; aged 49; a member of the Oklahoma State Medical Association; until 1913 a practitioner of Erick; died at his home, January 20, from cerebral hemorrhage.

George S. Wheeler, M.D., Waukegan, Ill.; Rush Medical College, 1850; aged 87; who practiced for a few years in Chicago and then moved to Waukegan where he kept a book shop for half a century; died at his home, February 20.

Oliver Hazard Jones, M.D. Miami Medical College, Cincinnati, 1875; aged 72; a member of the Indiana State Medical Association and a pioneer practitioner of Montgomery County, Ind.; died at his home in Crawfordsville, January 30.

William A. Bell, M.D. University of Pennsylvania, Philadelphia, 1873; aged 65; a member of the Medical Society of Virginia and a widely known practitioner of the Shenandoah Valley; died at his home in Winchester, Va., January 29.

Jabez Dean Hammond, M.D., Chicago; Rush Medical College, 1885; aged 55; a Fellow of the American Medical Association, since 1893 house physician at the Congress Hotel, Chicago; died at his home, February 15, from uremia.

George W. H. Williams, M.D. Philadelphia University of Medicine and Surgery, 1869; aged 79; an eclectic practitioner of North Grosvenordale, Conn.; died at his home, January 29, from injuries received in a fall four weeks before.

Calvin Emerick, M.D. Albany (N. Y.) Medical College, 1897; aged 45, formerly health officer of Ulster, N. Y.; state fish and game warden for Ulster County, N. Y.; died at his home in Glasco, N. Y., January 26, from pneumonia.

Thomas Wilkinson Burke, M.D. Georgetown University, Washington, D. C., 1884; aged 67; died in the United States Pension Bureau, Washington, November 15, from chronic nephritis and acute cardiac dilatation.

Charles S. Brown, M.D. Medical College of Georgia, Augusta, 1890; aged 54; a member of the Florida State Medical Association; died at his home in Live Oak, Fla., January 27, from cirrhosis of the liver.

Jocelyn William Blackmer, M.D. University of Maryland, Baltimore, 1915, aged 28, intern at the Springfield State Hospital, Sykesville, Md.; died at the home of his mother in Salisbury, N. C., February 1.

Patrick D. Connolly, M.D. Missouri Medical College, St. Louis, 1885; aged 53; formerly a member of the Missouri State Medical Association; died at his home in St. Louis, January 30, from pneumonia.

William Alexander Marbury, M.D. University of Maryland, Baltimore, 1867; aged 74; formerly of Woodville and Aquasco, Md.; died at the home of his sister in Laurel, Md., February 3.

George P. Rider, M.D., Wilmette, Ill.; Albany (N. Y.) Medical College, 1888; aged 51; who abandoned practice after a short time for mining interests; was shot in Denver, February 9, and died two days later from pneumonia.

Walter H. Mayhew, M.D., Sabillasville, Md.; University of Maryland, Baltimore, 1901; aged 37; formerly demonstrator of histology and embryology in his alma mater; died in Baltimore, December 13, from pulmonary tuberculosis.

Mary Lucinda Dunlap, M.D., Des Moines, Iowa; Iowa Eclectic Medical College, Des Moines, 1888; aged 59; professor of physiology in her alma mater; died in the Iowa Lutheran Hospital, Des Moines, February 5.

James Brown, M.D., Ashton, Ill.; Rush Medical College, 1862; aged 84; surgeon of the Sixty-Sixth Illinois Volunteer Infantry throughout the Civil War; a practitioner of Ashton since 1868; died at his home, January 23.

John G. Ryerson, M.D., Boonton, N. J.; College of Physicians and Surgeons in the City of New York, 1860; aged 82; a member of the Medical Society of New Jersey; formerly a druggist; died at his home, February 10.

Cornelius Baldwin, M.D. University of Pennsylvania, Philadelphia, 1861; aged 78; surgeon in the Confederate service during the Civil War; died at his home in Winchester, Va., January 29.

John H. Johnson, M.D. Georgia College of Eclectic Medicine and Surgery, Atlanta, 1906; aged 39; of Falco, Ala.; was shot and killed about 18 miles south of Andalusia, Ala., January 8.

John A. Masterson, M.D. Rush Medical College, 1871; aged 72; a member of the State Medical Society of Wisconsin; died at his home in Watertown, Wis., February 8.

Thomas Hayes Derrick, M.D. Meharry Medical College, Nashville, Tenn., 1913; aged 39; a practitioner and druggist of Nashville, Tenn.; died in Phoenix, Ariz., January 30.

Charles E. Scholes, M.D. University of Tennessee, Nashville, 1892; a member of the Kentucky State Medical Association; died at his home in Lowes, Ky., February 5.

John Mills Minter, M.D. Northwestern University Medical School, Chicago, 1909; aged 33; died at his home in Burley, Idaho, December 31, from lobar pneumonia.

Augustus Charles Post, M.D. Albany (N. Y.) Medical College, 1911; aged 27; of Catskill, N. Y.; was run over by a train at Catskill, January 2, and instantly killed.

E. Willard Wells (license, California Homeopathic Board, 1876), aged 82; also a pharmacist; died at his home in Eureka, Calif., January 29, from senile debility.

W. L. Evans (license, Indiana, 1878), aged 86; for many years a practitioner of Washington and Noogootee, Ind.; died at his home near Noogootee, February 1.

William W. Bell, M.D. Jefferson Medical College, 1858; aged 77; a veteran of the Civil War; died at his home in Chicago, November 27, from arteriosclerosis.

Robert F. Adams, M.D. University of Louisville, Ky., 1875; aged 78; of Sharpsville, Ky.; died in Johnsonville, Ky., January 19, from lobar pneumonia.

Edwin Behymer, M.D. Eclectic Medical Institute, Cincinnati, 1875; aged 68; died at his home in Cincinnati, January 31, from heart disease.

Thaddeus Lewis (license, Michigan, 1901), aged 66; an eclectic practitioner of Central Lake, Mich.; died at his home, February 3, from pneumonia.

Martin Kennedy, M.D. University of Pennsylvania, Philadelphia, 1868; aged 79; of Bartow, Fla.; died in Jacksonville, Fla., January 28.

George W. Huey, M.D. University of Alabama, Mobile, 1891; aged 53; died at his home in Hartford, Ala., January 14, from nephritis.

Robert Carey Buck, M.D. University of Maryland, Baltimore, 1874; aged 64; died suddenly at his home in Manassas, Va., February 1.

Augustus Ralston, M.D. Ohio Medical College, Cincinnati, 1881; aged 70; died at his home in New Corydon, Ind., February 6.

Alfred L. Laliberte, M.D. Laval University, Quebec, 1904; aged 39; died at his home in Minneapolis, February 5, from pneumonia.

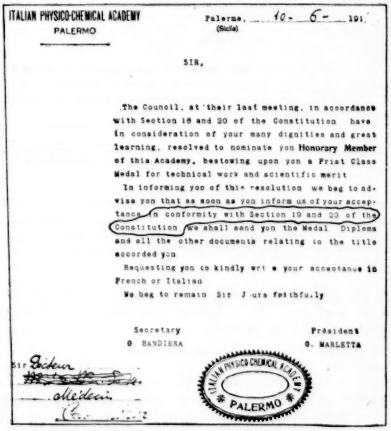
Dirk Van Kolken, M.D. Netherlands, about 1866; aged 79; died at his home in Grand Rapids, Mich., January 7, from gastritis.

The Propaganda for Reform

IN THIS DEPARTMENT APPEAR REPORTS OF THE COUNCIL ON PHARMACY AND CHEMISTRY AND OF THE ASSOCIATION LABORATORY, TOGETHER WITH OTHER MATTER TENDING TO AID INTELLIGENT PRESCRIBING AND TO OPPOSE MEDICAL FRAUD ON THE PUBLIC AND ON THE PROFESSION

THE ITALIAN PHYSICO-CHEMICAL ACADEMY

Many and various are the letters received by THE JOURNAL asking for information about an alleged scientific organization in Italy styled *l'Académie Physico-Chimique Italienne.* This Italian Physico-Chemical Academy is operated from Palermo, Italy. Here is the scheme: Dr. John Doe, an American physician receives an imposing-looking letter bearing the Palermo, Sicily, postmark and addressed to *"Monsieur le Docteur John Doe, Médecin."* On opening the letter *"Monsieur le Docteur"* finds that the "Council" of *l'Académie Physico-Chimique Italienne* has nominated him "Honorary Member of this Academy" and furthermore has bestowed on him "a First Class Medal for technical work and scientific merit."



ITALIAN PHYSICO-CHEMICAL ACADEMY
PALERMO

Palermo, 10-6-191
(Sicily)

SIR,

The Council, at their last meeting, in accordance with Section 18 and 20 of the Constitution have in consideration of your many dignities and great learning, resolved to nominate you **Honorary Member** of this Academy, bestowing upon you a First Class Medal for technical work and scientific merit.

In informing you of this resolution we beg to advise you that as soon as you inform us of your acceptance in conformity with Section 19 and 22 of the Constitution we shall send you the Medal Diploma and all the other documents relating to the title accorded you.

Requesting you to kindly wri e your acceptance in French or Italian

We beg to remain Sir Yours faithfully

Secretary
G. BANDIERA

President
G. MARLETTA

Sir Richard Roe
Middlesex

ITALIAN PHYSICO-CHEMICAL ACADEMY
PALERMO

Reduced photographic reproduction of the stock letter sent to American physicians by the Italian Physico-Chemical Academy. The "joker" lies in the requirement around which we have drawn a line.

All this, "in consideration of your many dignities and great learning." Dr. Doe is told that as soon as he will write an acceptance of this honor "in conformity with Section 19 and 22 of the Constitution" he will be sent "the Medal, Diploma and all the other documents relating to the title accorded." The joker in the scheme lies in the necessity for Dr. John Doe "conforming" with "Section 19 and *22* of the Constitution." Here are the sections:

"*Sec. 19.*—The entrance fee to cover office and postal expenses, including postage of diploma is 5 Dollars, and is payable once at the admission to the Academy by special bulletin filled up, stamped and signed."

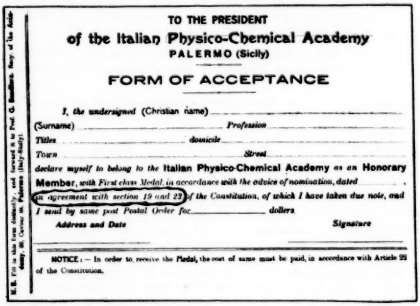
"*Sec. 22.*—Those to whom medals are awarded and who wish to possess them must pay for their coinage 10 Dollars as the Academy does not, at present, possess the necessary funds for this purpose. . . ."

In short the whole thing means that if Dr. Doe is willing to send $15 in good American money he will receive in due time from the academy a "diploma" and a gilt (not gold) medal.

About four years ago when the "Academy" seemed to be making a particularly heavy bid for American dollars the member of THE JOURNAL staff in charge of the Propaganda

Department wrote to the "Academy," on his personal stationery, asking about the cost of membership in the "Academy" and asking also for a copy of the "prospectus." And that was all! In reply he received a letter stating that "in consideration of" his "many dignities and great learning" he had been nominated "an officer of this academy" and had been awarded *"la médaille de première classe"* for humanitarian work and scientific merit. In order to obtain these tokens of the "Academy's" regard it would be necessary to inform the "Academy" of acceptance "in conformity with Section 19 and 22. . . ." As the Propaganda Department did not consider the diploma and gilt medal worth $15 even as an exhibit for its museum of fakes, the "Form of Acceptance" was not filled in and returned "in accordance with Section 19 and 22."

The leading spirits in the operation of this diploma and medal mill are D. and G. Bandiera who, so far as we can



TO THE PRESIDENT
of the Italian Physico-Chemical Academy
PALERMO (Sicily)

FORM OF ACCEPTANCE

I, the undersigned (Christian name) _____
(Surname) _____ *Profession* _____
Titles _____ *domicile* _____
Town _____ *Street* _____
declare myself to belong to the Italian Physico-Chemical Academy *as an* Honorary Member, *with First class Medal, in accordance with the advice of nomination, dated* _____, *in agreement with section 19 and 22 of the Constitution, of which I have taken due note, and I send by same post Postal Order for* _____ dollars.

Address and Date *Signature*

NOTICE. — In order to receive the Medal, the cost of same must be paid, in accordance with Article 22 of the Constitution.

Photographic reproduction (reduced) of the "Form of Acceptance" to "membership" in the "Italian Physico-Chemical Academy." Filling out this blank and sending it *with $15.00* to the "Academy" will bring the gilt medal and "diploma."

learn, are neither physicians nor pharmacists nor have any scientific standing. The "Academy" has been referred to at various times[1] by THE JOURNAL.

TANLAC

"Tanlac" is a sky-rocket in the pyrotechnics of fakery. It is at present making a brave display with much noise and many sparks; the stick will come down in due time. Tanlac is another of the increasingly popular alcoholic nostrums that presumably fill a much felt want—want, not *need*—in those parts of the country where Demon Rum has been driven into the tall timbers. It was first exploited in the South—naturally. This department paid its respects to Tanlac in the issue of June 5, 1915.[2] The advertising campaign of this product has, apparently, reached Michigan and the Dairy and Food Department of that state in Special Bulletin No. 50, published Feb. 12, 1916, has something to say about Tanlac under the title "The Latest Cure-All." As we still have a good many inquiries regarding Tanlac it seems worth while to reprint the report of Food Commissioner Helme of Michigan on the product. The findings of the Michigan chemists agree essentially with those of the Association's chemical laboratory. Here, in part, is the Michigan report:

"A new panacea for the cure of 'all ailments of the stomach, kidneys and liver, catarrhal affections of the mucous membranes, rheumatism, nervous disorders and the like' is offered to the public under the name of Tanlac. The label on the bottle neatly avoids the pure drugs act by claiming to be only a 'tonic and system purifier.' An analysis of Tanlac in the laboratory of this Department shows the following:

"Alcohol	16.4 per cent.
"Glycerin	2.0 per cent.
"Licorice	Present.
"Aloes or Cascara	Present.
"Gentian	Present.
"Alkaloids (Berberin)	Trace.

"The presence of a trace of tartaric acid shows that wine is the base of this medicine. The 16 per cent. alcohol gives it the 'kick' that makes a fellow feel good and ought to fill a long felt want in 'Dry Counties.' Aloes is a laxative. Gentian is a bitter drug, a so-called tonic. If the reader wants to be cured by the Tanlac route at one-fourth the expense, let him get a quart bottle of good sherry wine. Then go to the local druggist and get 1¼ drams of glycerin and 2 drams each of aloes, gentian, licorice and cascara. Mix (if you wish) and you will have Tanlac so near that neither you nor the manufacturer can tell the difference. This formula will give four times the quantity found in an ordinary $1 bottle of Tanlac."

1. THE JOURNAL A. M. A., June 29, 1907, p. 2196; Oct. 21, 1911 (Berlin letter and editorial); May 11, 1912, p. 1455; March 8, 1913, p. 770; May 10, 1913, p. 1480; Nov. 8, 1913, p. 1737.
2. THE JOURNAL's article on Tanlac has been reprinted in the pamphlet, "Miscellaneous Nostrums," price 10 cents.

Correspondence

The Value of Contesting a Hopelessly Fatal Issue

To the Editor:—The recent appearance of a valuable article by Reilly, on "The Signs and Symptoms of Impending Death" (THE JOURNAL, Jan. 15, 1916, p. 160), suggests forcibly those questions which center around the familiar conservative principle that governs the physician, in theory at least, in the face of such an issue. The "Cui bono?" cannot be escaped, whether we ask it of ourselves, or meet it in the person of our patients' relatives, in our friends, or in our own flesh and blood.

Setting aside for the moment the ethical and social aspects of euthanasia, which after all we answer so easily in generalities and with such difficulty when we confront the specific case, it is worth while for the moment to weigh a less familiar aspect of the value of a physician's futile struggle against what was, from the start, an inevitably fatal issue.

Issues in medicine whose hopeless outcome can be immediately foreseen are few. But by indefinite gradations, impending death seems to pass from an ultimate to an immediate certainty in all of the diseases which profoundly change the parenchymatous structure of important organs. It is this indefinite gradation from ultimate to immediate which, in a final analysis, deprives us of the right to draw the line at which our efforts to conserve shall stop. The lapse into a fatalistic, calm acceptance of the fact of impending death is none the less only too easy for us in these last stages—made easier for us by the friends, and perhaps easiest of all by the patient himself. It seems a ruthless thing even where there is no pain, not even consciousness, to harry the body back to life. It demands, too, a vigilance, an energy, a determination, a resource, which exhausts the one who brings it to bear. It burns time and consumes nerve. Not without reason do we rate the bringing in of life and the fighting of imminent death as the hardships of the career. There comes to every man the temptation to let go. The ethic of the work slips from him; it seems a needless thing to drag this body back once more for a precarious minute or hour, to be the agony of friends and to sap the living in the process of dying. He lets the hopeless battle be lost by his own unconscious choice, and the spirit returns unto God who gave it.

But somewhere in this gentle sophistry to which we yield ourselves, we have missed contact with a vital thing. The fight against impossible odds is a maker of character. The man in whom it is not bred, bone of bone, is unseasoned. The man who declines to make it is unsafe or overripe. We can appeal to ourselves for death. To every one of us there may come a time when we appeal to the physician for life.

The struggle against certain death is a form of preparation for the service of the living. Into whose hands do we commend the critical case, the issue of a life precious to us? We yield it into the hands of the man of whom battle is a

part, to whom surrender is unknown, for whom artificial respiration, oxygen, intravenous stimulation and all the paraphernalia of desperation are old friends, rather than untried servants in the house of his resources. To the man who never left a man to die, we commend ourselves *in extremis* if life still seems good. To the training of such men the hopeless death-bed can contribute the unique, seasoning touch that perfects their skill. The hopeless conveys to such seasoned men no impulse to surrender. As in chess, so in the fight for life, the lost game makes the player.

To every physician there come many such critical moments, in which he recognizes and confronts the inevitable. If, especially in his earlier experience, he gives ground before it, he has lost a priceless heritage. The going down to death only seldom must mean pain to the dying in these days. To oppose it when the struggle means unrelievable agony is perhaps too much to ask. But in those cases in which this need not be, to summon every resource of skill and personality, and in his shirt-sleeves, with the sweat running into his eyes, to fight to stave off another's dissolution, makes a man. Here often for the first time one attains to the true appreciation of the capacity of the body to rally to its own defence, and to the first understanding of the possibilities of digitalis and atropin. He who has not brought back the seemingly dead to life, only to lose hardly in the end, fighting to the last ditch, has not won his spurs.

It is in the air of some wards and of some hospitals to watch an impending death almost with resignation. The young physician who breathes such contagion weakens in the knees. The dying turn black before him, and go down to the River Styx, crying out for help, and he stands by, lacking both the impulse and the knowledge for effective response. Many a worth-while life will slip through that man's hands before his course is run. Another, trained to a more far-sighted ideal, springs into sudden, well-directed action, and drags back the limp figure from the World of Shades, if only for an hour. The last man has, by the fight, added a cubit to his stature.

It is the service of inevitable death to school us for the defense of life, and only to those who have met and striven against it, even though to their own ultimate defeat, comes the power to give life where there is still hope. Let us rid ourselves of sophistry, at least on those occasions when, as physicians, we must measure up to the words of the Apocrypha, spoken of each one of us: "Yea, there is a time when in his hands is the issue of life. . . ."

JOHN H. STOKES, M.D., Chicago.

The Kinetic Drive

To the Editor:—In response to the statement of Dr. Pike (Correspondence, THE JOURNAL, Feb. 19, 1916, p. 591) I beg leave to confine myself to the two points that have been more objectively discussed.

With reference to the action of the iodin compound of the thyroid in the animal organism, the belief is expressed that "a misstatement of fact" was made in our commentary. In effect we expressed the opinion that it is superficial reasoning to pass so readily from observed facts about the influence exerted on electrical permeability of cells by sodium iodid, which by dissociation yields iodin ions, to the conclusion that an organic iodin compound, which contains "masked" or undissociable iodin, has the same influence. If there is "a misstatement of fact" in this, it must be about the undissociable iodin. To be brief: *There is nothing* in Scudder's tables which indicates that the dissociation involves the ionization of iodin in those and organic compounds which Dr. Pike mentions. It is permissible to deduce from the principles of physical chemistry accepted at present that the dissociation in these acid compounds which he mentions occurs in the carboxyl group; it is customary for writers on physical chemistry to refer to an element, bound as iodin is in these compounds, and most likely in the thyroid compounds also, as undissociable; Dr. Pike adduces nothing to show that it is not permissible to continue to refer to elements so bound in "masked" form as undissociable. But even though it ever should develop that we are in error about this, is not our comment justified by its evident object, namely: to urge the desirability of applying experiment to the settlement of this question about the thyroid substance?

It was not necessary to point out the stimulating effect of free hydrogen ions on the respiratory center and their contrast effect on the cortical cells. It serves the intent of our comment on this matter to have these points reinforced. It is this contrast of effects in different parts of the nervous system which shows the unreasonableness of ascribing the rise of nerve impulses to difference of electric potential between different points on the neuromuscular apparatus. If the nerve impulses from the cerebral cortex owe their origin to a different potential between the cortex and the nerve end-organ, the impulses from the respiratory center must also depend on a difference of potential between the center and respiratory muscles—unless the nerve impulses in these two mechanisms are fundamentally dissimilar. For the present we adhere to the old-time notion that all nerve impulses are fundamentally similar. If increased hydrogen-ion concentration abolishes the difference of potential between the cortex and muscles, it must do the same thing between the respiratory center and muscles. But in the cortex greater concentration of hydrogen ions causes paralysis of the cells, while in the respiratory center it causes greater excitation; how does the latter phenomenon comport with the view that the rise of nerve impulses is due to difference of electric potential? Or how again are we to account for afferent nerve impulses—unless again they are fundamentally dissimilar to motor nerve impulses?

ALBERT WOELFEL, M.D., Chicago.

Esperanto and the War

To the Editor:—In connection with the item on this subject (THE JOURNAL, Feb. 5, 1916, p. 439), allow me to invite attention to the further activities of Esperantists, and to the value and use of Esperanto in the present war: Esperantists have sent several fully equipped Red Cross Esperanto ambulances into the field, with personnel. Esperanto is being taught in the prison and internment camps, so that there may be a "common" language. There is an Esperanto "repatriation" bureau maintained in Geneva, Switzerland, through which disrupted families are brought together, correspondence forwarded, and much other good of a like nature accomplished. Statements relating to "justification" for the war were issued in Esperanto by governments, notably the German, which also issued official war bulletins in Esperanto, for international distribution. Keys, weighing but 5 grams, though containing the elements of the language and a vocabulary of more than 2,000 words, are published in practically all languages, for international conversational and correspondence purposes. A similar series of Esperanto Red Cross booklets is published, and much other work is being accomplished along these lines.

In short, Esperanto is proving its great value for its intended purposes, and it is the best passport in the warring countries that one may possess.

Mil faktoj atestas la meriton praktikan de la nomita lingvo.

H. W. YEMANS, M.D., Fort Warren, Boston.
First Lieutenant, M. R. C., U. S. Army.

Constipation in Causation of Epilepsy and Migraine

To the Editor:—I have read with a great deal of interest Dr. Reed's articles on epilepsy. His theory of an edema of the subcortical nerve tracts, accompanying or following a condition of general acidosis, which in turn results in some way from stasis of the bowel contents, seems to be a real step in the right direction.

But it has occurred to me, as it doubtless has to others, that this fails to account for the symmetrical manifestations of the typical attack of epilepsy. A symmetrical edema of both internal capsules is of course possible, but shall we say it is probable?

This theory would more nearly account for a typical attack of migraine, with its unilateral headache, hemianopsia, diplopia, paresis of the opposite extremities, and occasional motor aphasia in left hemicrania. Practically all migrainous patients are constipated, and practically all are relieved by large doses of sodium bicarbonate.

This is written, not in the spirit of criticism, but as a query, that more light may be thrown on these remarkable diseases.

L. K. STRATE, M.D., Sutton, Neb.

Queries and Minor Notes

ANONYMOUS COMMUNICATIONS and queries on postal cards will not be noticed. Every letter must contain the writer's name and address, but these will be omitted, on request.

GENOFORM

To the Editor:—Kindly inform me as to the composition of genoform, manufactured by C. Bischoff & Co., New York. It is not mentioned in New and Nonofficial Remedies. Please do not mention my name in THE JOURNAL.

E. A. C.

ANSWER.—Genoform, advertised as a remedy for gout, rheumatism, neuralgia, etc., is said to be "O- oxybenzoic acid methylene acetate, $C_{16}H_{12}O_6$," "a glycolester resulting from the interaction of acetyl-salicylic acid and formaldehyde." The manufacturers claim that it is split up in the intestines into salicylic acid, acetic acid and formaldehyd. The statement of composition is too indefinite to permit any real insight into its possible reactions. Even if formaldehyd were liberated in the intestines, however, it could not form combinations with the excess uric acid found in the system of gouty patients, and could not therefore exert the "anti-arthritic properties" as claimed.

LITERATURE ON PEPYS' DIARY

To the Editor:—Can you give me any information concerning medical articles, historical or otherwise, dealing with Mr. Samuel Pepys of diary fame? The diary is of extreme interest to physicians, as it contains a complete description of the London plague and many references to experiments performed before the Royal Society.

J. W. D., M.D., Baltimore.

ANSWER.—The following is a list of references to articles on this subject:

Geikie, A.: Samuel Pepys and the Royal Society, *Nature*, London, 1904-1905, lxxi, 415.

Power, D. A.: An Address on the Medical History of Mr. and Mrs. Samuel Pepys, *Lancet*, London, 1895, i, 1357; Who Performed Lithotomy on Samuel Pepys? ibid., 1904, i, 1011; An Address on Why Samuel Pepys Discontinued His Diary, ibid., 1911, i, 1687; Samuel Pepys and the Royal Society, *Brit. Med. Jour.*, 1912, ii, 184.

Carmichael, A. R.: The Eyesight of Samuel Pepys, *Lancet*, London, 1911, ii, 124.

Some Sidelights on Medicine in the Seventeenth Century (from the Diary of Samuel Pepys) *Univ. Med. Rec.*, London, 1914, v, 406.

Rogers, J. F.: Science from the Pages of Samuel Pepys, *Med. Times*, 1914, xlii, 340.

PYRAMIDON

To the Editor:—Kindly advise me as to the chemical composition and physiologic action of pyramidon.

R. LLOYD SMITH, M.D., Portland, Ore.

ANSWER.—Pyramidon is fully described in New and Nonofficial Remedies, 1916, p. 225. Pyramidon is known chemically as phenyl-dimethyl-dimethylamino-pyrazolon. It differs from antipyrin in that a dimethylamino group has replaced a hydrogen atom of the pyrazolon nucleus. Pyramidon acts as an antipyretic and anodyne, like antipyrin, but is effective in small doses. Like other antipyretics, it should be cautiously employed in the treatment of infectious fevers.

EXCHANGE OF MEDICAL BOOKS

To the Editor:—In my struggle to keep up with the progress of medicine, I have often wondered why the progressive publishers of medical books do not offer some exchange plan which would enable a physician to keep an up-to-date library without prohibitive cost.

It seems to me that the prices now charged for medical works are sufficiently large to enable the publishers to give us some credit for the old book in exchange for a later edition or revision.

Perhaps some suggestion along this line from THE JOURNAL would be followed by the publishers to our mutual advantage.

J. F. MIXON, M.D., Valdosta, Ga.

Medical Education and State Boards of Registration

COMING EXAMINATIONS

ARIZONA: Phoenix, April 4-5. Sec., Dr. John Wix Thomas, 200 National Bank of Arizona Bldg., Phoenix.

CALIFORNIA: Los Angeles, April 4. Sec., Dr. Charles B. Pinkham, Room 527 Forum Bldg., Sacramento.

COLORADO: Denver, April 4. Sec., Dr. David A. Strickler, 612 Empire Bldg., Denver.

CONNECTICUT: Regular, New Haven, March 14-15. Sec., Dr. Charles A. Tuttle, 196 York St., New Haven; Homeopathic, New Haven, March 14. Sec., Dr. Edwin C. M. Hall, 82 Grand Ave., New Haven; Eclectic, New Haven, March 14. Sec., Dr. T. S. Hodge, 19 Main St., Torrington.

FLORIDA: Homeopathic, Jacksonville, March 10. Sec., Dr. J. B. Griffin, St. Augustine.

IDAHO: Boise, April 4. Sec., Dr. Charles A. Dettman, Burke.

MAINE: Portland, March 14-15. Sec., Dr. Frank W. Searle, 776 Congress St., Portland.

MASSACHUSETTS: Boston, March 14-16. Sec., Dr. Walter P. Bowers, Room 501, No. 1 Beacon St., Boston.

MINNESOTA: Minneapolis, April 4-7. Sec., Dr. Thomas S. McDavitt, 814 Lowry Bldg., St. Paul.

MISSOURI: St. Louis, March 20-22. Sec., Dr. J. A. B. Adcock, State House, Jefferson City.

MONTANA: Helena, April 4. Sec., Dr. William C. Riddell, Helena.

PORTO RICO: San Juan, April 4. Sec., Dr. Quevedo Baez, 66 Allen St., San Juan.

RHODE ISLAND: Providence, April 6. Sec., Dr. Gardner T. Swarts, 315 State House, Providence.

UTAH: Salt Lake City, April 3-4. Sec., Dr. G. F. Harding, 407 Templeton Bldg., Salt Lake City.

WYOMING: Laramie, March 14-16. Sec., Dr. H. E. McCollum, Laramie.

New York May-June Report

Mr. H. H. Horner, chief of the Examinations Division of the New York State Board of Medical Examiners, reports the written examinations held at Albany, Buffalo, New York and Syracuse, May 28-29 and June 29-July 2, 1915. The total number of subjects examined in was 8; total number of questions asked, 80; percentage required to pass, 75. The total number of candidates examined was 474, of whom 387 passed, including 3 osteopaths, and 87 failed, including 3 osteopaths. Fifteen candidates were licensed on the indorsements of credentials. The following colleges were represented:

College	PASSED Year Grad.	Total No. Licensed
Denver and Gross College of Medicine	(1910)	1
Georgetown University	(1913)	1
George Washington University	(1910)	1
Howard University	(1911)	1
Northwestern University	(1911)	1
University of Illinois	(1914)	1
University of Louisville	(1911)	1
Tulane University of Louisiana	(1908)	1
College of Physicians and Surgeons, Baltimore	(1914)	1
Johns Hopkins University	(1912, 2) (1913) (1914) (1915, 9)	13
University of Maryland	(1911)	1
Boston University	(1912)	1
Harvard University	(1913) (1915)	2
Tufts College Medical School	(1913, 2) (1915)	3
University of Michigan Medical School	(1915)	1
Albany Medical College	(1913, 3) (1914, 6) (1915, 24)	33
Columbia University, College of Physicians and Surgeons	(1911, 2) (1912, 2) (1913, 3) (1914, 7) (1915, 31)	45
Cornell University	(1912) (1913, 2) (1914, 2) (1915, 8)	13
Fordham University	(1912, 2) (1913) (1914) (1915, 11)	15
Long Island College Hospital	(1912, 3) (1913, 2) (1914, 5) (1915, 59)	69
New York Homeo. Medical College and Flower Hospital	(1913, 3) (1914, 3) (1915, 13)	19
New York Medical College and Hospital for Women	(1915)	3
Syracuse University	(1912) (1914, 2) (1915, 8)	11
University and Bellevue Hospital Medical College	(1913, 4) (1914, 2) (1915, 50)	56
University of Buffalo	(1914, 4) (1915, 50)	54
Hahnemann Medical Coll. and Hosp., Philadelphia	(1912)	1
Jefferson Medical College	(1913, 3) (1914) (1915)	5
Medico-Chirurgical College of Philadelphia	(1914)	1
University of Pennsylvania	(1913) (1914) (1915)	3
Woman's Medical College of Pennsylvania	(1915)	3
University of Nashville	(1909)	1
Vanderbilt University	(1909) (1912)	2
University of Vermont	(1912)	1
University of Virginia	(1911) (1913)	2
Queens University	(1909) (1911, 2) (1915)	4
University of Toronto	(1913) (1915)	2
Laval University, Quebec	(1900)	1
McGill University	(1906) (1913) (1915, 2)	4
University of Prague	(1906)	1

University of Jena	(1909)	1
University of Tübingen	(1911)	1
University of Naples	(1912) (1913)	2
University of Geneva	(1913)	1

FAILED

Georgetown University	(1913)	1
Howard University	(1911)	1
Illinois Medical College	(1898)	1
University of Louisville	(1912)	1
Baltimore Medical College	(1913)	1
College of Physicians and Surgeons, Baltimore	(1912)	1
Johns Hopkins University	(1910) (1914)	2
Tufts College Medical School	(1905)	1
Detroit College of Medicine and Surgery	(1911) (1913)	2
University of Michigan Homeo. Med. School	(1914) (1915)	2
Albany Medical College	(1913) (1914, 6) (1915, 2)	9
Columbia Univ. Coll. of Phys. and Surgs.	(1914) (1915, 5)	6
Eclectic Med. Coll. of the City of New York	(1910)	1
Fordham University	(1913) (1914, 3) (1915, 6)	10
Long Island College Hospital	(1913) (1914) (1915, 3)	5
New York Homeo. Medical College and Flower Hospital	(1912) (1913) (1914, 5) (1915, 6)	13
New York Medical College and Hospital for Women	(1915)	1
Niagara University	(1898)	1
Syracuse University	(1913, 2) (1915)	3
University and Bellevue Hosp. Med. Coll.	(1914) (1915, 2)	3
University of Buffalo	(1911) (1914, 2) (1915, 2)	5
Jefferson Medical College	(1909) (1912, 2)	3
Medico-Chirurgical College of Philadelphia	(1902)	1
University of Pennsylvania	(1890)	1
Woman's Medical College of Pennsylvania	(1915)	2
University of Vermont	(1914)	1
McGill University	(1902)	1
University of Berlin	(1914)	1
University of Catania	(1912)	1
University of Naples	(1905) (1909)	2
Syrian Protestant College	(1912)	1

LICENSED THROUGH RECIPROCITY

College	Year Grad.	Reciprocity with
Hahnemann Medical College and Hospital, Chicago	(1905)	Wisconsin
College of Physicians and Surgeons, Baltimore	(1908)	New Jersey
University of Maryland	(1911)	Delaware
Columbia University, College of Phys. and Surgs.	(1901)	New Jersey
N. Y. Homeo. Med. Coll. and Flower Hosp.	(1912) (1913)	New Jersey
Medico-Chirurgical College of Philadelphia	(1914, 2)	Delaware
University of Pennsylvania	(1901)	New Jersey
Woman's Medical College of Pennsylvania	(1902)	Indiana
Medical College of Virginia	(1901) (1913)	Virginia
University of Berlin	(1899)	Utah
University of Pisa	(1910)	Ohio

Connecticut November Report

Dr. Charles A. Tuttle, secretary of the Connecticut Medical Examining Board, reports the oral, practical and written examination held at New Haven, Nov. 9-10, 1915. The total number of subjects examined in was 7; total number of questions asked, 70; percentage required to pass, 75. The total number of candidates examined was 29, of whom 21 passed and 8 failed. Five candidates were licensed under an exemption clause. The following colleges were represented:

PASSED

College	Year Grad.	Per Cent.
Yale University	(1913) 79; (1915)	76.9
College of Physicians and Surgeons, Baltimore	(1913)	77.1
Johns Hopkins University	(1906) 76.9; (1912) 87.4; (1914)	84.8
University of Maryland	(1912)	79.4
Harvard Univ.	(1912) 80.5; (1913) 75.6; (1914) 82.3; (1915)	78.2
Tufts College Medical School	(1913)	82.8
Albany Medical College	(1912)	83.2
Columbia University, College of Phys. and Surgs.	(1915)	87.9
University and Bellevue Hosp. Med. Coll.	(1903) 77.4; (1914)	79
Jefferson Medical College	(1913)	79.1
Medico-Chirurgical College of Philadelphia	(1914)	76.1
Woman's Medical College of Pennsylvania	(1899)	80.1
University of Vermont	(1914)	80.2, 82.2

FAILED

College of Physicians and Surgeons, Baltimore	(1910)	69.1
Eastern University*	(1913)	53.8
Maryland Medical College	(1913)	58.5
University of Maryland	(1913)	63.2
College of Phys. and Surgs, Boston	(1908) 56; (1910)	46.6
Meharry Medical College	(1913)	66.7
University of Budapest	(1898)	67.5

LICENSED UNDER AN EXEMPTION CLAUSE

College	Year Grad.	Total No. Licensed
Johns Hopkins University	(1901)	1
Coll. of Phys. and Surgs., in the City of New York	(1889)	1
Syracuse University	(1896)	1
University of Buffalo	(1893)	1
McGill University	(1881)	1

* This college was officially reported as not recognized by the Maryland State Board of Medical Examiners.

Book Notices

DISPOSAL OF SEWAGE. By Leonard Metcalf and Harrison P. Eddy. Volume 3 of American Sewerage Practice. Cloth. Price, $6 net. Pp. 851, with 230 illustrations. New York: McGraw-Hill Book Company, 1915.

This volume is the third in a series by the same authors on American sewerage practice, the first being the design of sewers, and the second on the construction of sewers. There are already two excellent books by American writers on sewage disposal—one by Kinnicut, Winslow and Pratt, the other by George W. Fuller—and the question might be raised whether a third treatise on the same subject is needed within so brief a period after publication of the others. New light, however, is being thrown almost daily on the subject of sewage treatment, and opinions and methods are changing so rapidly that any new and authoritative book in this field must prove valuable to practical workers. This is especially the case with such a masterly summary as this one, enriched as it is with the authors' well-matured opinions. Modern developments are described with a wealth of detail and a balanced judgment that can hardly be praised too highly. There is little to criticize adversely. We notice that certain aspects of the relation of bacteria to sewage disposal are handled somewhat gingerly, as might perhaps be expected from the fact that the authors' experience has been largely on the engineering side. To judge from the discussion of the production of hydrogen sulphid by bacteria (p. 100), the authors do not seem to be familiar with the important work of Redfield and of Lederer. The lactose bile test for *Bacillus coli* (p. 108) is apparently considered by the authors in a more favorable light than is warranted by the recent trend of opinion among water bacteriologists. Considering the book in the most critical way, however, it must be regarded as a very valuable addition to the list of excellent American books on sewage treatment. The typography and illustrations are excellent. A thin but good quality of paper is used, so that the volume of 850 pages is easy to handle and consult.

AN AUTOBIOGRAPHY. By Edward Livingston Trudeau, M.D. Cloth. Price, $2. Pp. 322, with illustrations. Philadelphia: Lea & Febiger, 1916.

One of the best known institutions devoted to the treatment of pulmonary tuberculosis is that at Saranac Lake, New York. It is the result of the working out of an idea—the development of the best method of treating consumption, based on scientific observation, on practical clinical experience, and on laboratory research, especially with due regard to the needs of those of limited means. But while the reputation of the institution is world-wide, few realize how extensive the Adirondack Cottage Sanitarium has become. Most remarkable is the fact that, to all intents and purposes, the institution is the result of the indomitable energy, perseverance and altruistic labors of one man, and he suffering to such an extent that he was bedridden half the time, and daily fighting for his very life.

Trudeau's autobiography is more than a story of his life; it is a history of the development and growth of the institution he created, as well as the newer, the modern methods of treating consumption. The book, therefore, is of practical value to every physician interested in this disease. But it is what Trudeau did for humanity, unselfishly and in spite of physical disability and other obstacles which few individuals would have overcome, that makes the book interesting and worth while. And it is all told simply, and with a perfect effacement of the ego. Those who knew Trudeau would expect this: large hearted, unselfish to the extreme, giving credit to others when he, himself, deserved it.

Trudeau was a pioneer, literally. He went to the Adirondacks with a forlorn hope, and remained through that first winter almost alone, when all his friends told him it was suicidal to do so. But he did not know what tremendous consequences would follow; he did not dream what was to result, what benefits to the consumptive would follow this experience at Paul Smith's.

The great asset, the important factor, in the personality of Dr. Trudeau, was a remarkable faculty of making and keeping friends. This spelled success; this built the cottages, laboratories, the administration building, the three churches for which he was responsible. Luck, fortune, his family connections, what you will, may have had something to do with it; but, after all, it was the personal equation, the man himself, that counted. He had ideas which he wanted to carry out for humanity, which required money. He was optimistic not only as to the possibility of carrying out these ideas, but also as to what good would result to humanity if they were carried out. Luck may be credited with the fact that many of his friends were well-to-do, if not wealthy. Harriman was a life-long and very close friend. "I was always keenly interested in everything I undertook, and was by temperament an optimist." This tells the story. He was intensely interested; his whole soul was in his work, and he was hopeful to the *n*th degree. His earnestness and hopefulness were an inspiration to his friends to give. "The generosity and readiness," he says, "with which people have given me money has ever been, and is even now, a matter of wonderment to me." It need not have been; in fact, a few pages farther on he says, "The personal element must enter to some extent into such work [that of securing funds] for all appeals to the public, no matter when or how well presented, which have been made at different times in print by friends of the institution have never met with the least response." It was the personal element, the plain yet beautiful character in that frail body which made possible the remarkable success of Edward Livingston Trudeau's life work.

Even though one did not know the man, as one reads these happenings of the years as they pass in the life of Trudeau and his little family, the explanation of how he accomplished what he did is revealed.

MODERN ASPECTS OF THE CIRCULATION IN HEALTH AND DISEASE. By Carl J. Wiggers, M.D., Assistant Professor of Physiology in Cornell University Medical College. Cloth. Price, $3.75 net. Pp. 378, with 104 illustrations. Philadelphia: Lea & Febiger, 1915.

This book is divided into three sections. The first discusses the physiology of the circulation in a comprehensive manner, bringing the subject up to date. The second section discusses the graphic and instrumental methods used in the study of the phenomena of the circulation, describing in detail the string galvanometer and other modern and approved methods. The third section discusses the pathologic conditions of the circulation, and tries whenever possible to correlate them with similar conditions produced experimentally. The author consistently explains these diseased conditions by the existing pathologic physiology. Although the work is somewhat technical and presupposes a good general knowledge of physiology, it should prove of value to the physiologist and the clinician desirous of being conversant with modern ideas of the circulatory disorders. The value of the work is enhanced by the illustrations, and the bibliography at the end of each chapter.

PULMONARY ACOUSTIC PHENOMENA. By C. M. Montgomery, M.D., of the Henry Phipps Institute, and E. A. Eckhardt, Ph.D., Department of Physics, University of Pennsylvania. Tenth Report of the Henry Phipps Institute. Paper. Pp. 117. Philadelphia: Henry Phipps Institute, 1915.

This is the report of "an investigation of some of the factors concerned in the origin and transmission of some of the sounds heard over the lungs in health and disease." The investigation has been carefully conducted by means of experiments, clinical observation with necropsy control, and a consideration of the laws and theories of physics. The sounds discussed are the voice sounds and the breath sounds as heard in the normal and the consolidated lung, over excavations, pleural effusion and pneumothorax. The book is not intended as a textbook on physical diagnosis. It will interest those who desire to understand more fully the mechanism of the phenomena heard on listening to the normal or diseased lung. It is a pleasure to see the high regard in which the pioneer work of Austin Flint is held, work not always accorded the great credit that it deserves.

Miscellany

Industrial Medical Supervision

Large industrial concerns are beginning to adopt medical supervision, both as an economic measure as it affects the employers, and in the interest of the employees. A pamphlet issued by the Eastman Kodak Company contains the address of its medical officer, Dr. Guy L. Howe, to the Rochester Chamber of Commerce. He describes the plan of organization of the medical work and some of the results. The work is divided into physical examination, care of accidents, care of sickness, sanitary inspection and health publicity. Every applicant for work who qualifies, by his own consent, undergoes a physical examination to determine his fitness for the work he expects to do. This examination includes a study of the heart and lungs, a test of the eyes for astigmatism, colorblindness and near and far vision, and a test of the hearing. Teeth, throat and neck are examined and a urinalysis is made. Rupture, flatfoot, varicose veins, hemorrhoids and evidence of communicable diseases are looked for. Vaccination is required in all who have not been successfully vaccinated within fifteen years. Anemia is looked for and blood pressures taken when deemed necessary. As instances of the findings among the 6,000 employees, it is said that moderate elevated blood pressure was found in 28, and serious in 42, or 1.1 per cent.; moderate heart disease in 38 and serious in 18, or 0.77 per cent.; ruptures (moderate) in 116 and severe in 39, or 2.57 per cent. Eight patients with tuberculosis are under treatment in sanatoriums or by open air methods at the expense of the company. Poor teeth which should have the attention of the dentist were found in 90 per cent., and in 1,557, or 25 per cent. of all employees, the dental defects were such that failure of treatment amounted to serious neglect. By these methods of examinations carried out periodically, incipient defects are discovered, and they also afford a basis of comparison of the physical status of employees from year to year. Instances are given in which the discovery of serious defects permitted the shifting of men to other work which they could do without injury. Specially defective employees to the number of 281 are examined every six or twelve months, and all dining room employees every three months. In accident cases the services of the company physician are available throughout until recovery, and hospital and consultation fees and the cost of roentgenograms are provided at company expense. This procedure was effective before the enactment of the workmen's compensation law. This law does not require the treatment of sickness among employees, but this constitutes a large part of the work of the medical department. From fifty to a hundred cases of minor illness are said to be taken care of every day. The department acts as a medical clearing house, determining when an employee is fit to remain at work and when he should be in bed. Employees are recommended to employ their family physicians, as determined by two questions: Would the man go to his physician if the department did not treat him, and could he afford to pay the necessary fee? A negative answer to either would determine treatment by the medical department. It is said, however, that ten patients are placed in the hands of the local medical profession to one who is taken away. Sanitary inspection each month has been arranged for in all factories, in dining rooms, workshops, washrooms, lockers, and of drinking water. A monthly health bulletin is distributed to employees, and a health manual has been prepared.

Laryngeal Ictus in Adults

E. Jeanselme and C. Lian discuss what they call the "ictus laryngé des bronchitiques" in the *Bulletins de la Société des hôpitaux* of Paris, 1915, xxxi, 571, relating two typical examples. After a brief tickling in the throat and spasm of coughing, the face becomes congested, and the man falls unconscious for a few seconds, but then recovers promptly and goes on with what he had been doing before the seizure, apparently unharmed. There was not the slightest sign of syphilis in one of the men; in the other

there was probable syphilis but nothing to indicate tabes. Both were inclined to congestion of the face, stout, with short necks, and were hard drinkers. In Bedos' compilation of forty-three cases of nontabetic laryngeal ictus, only one patient was between 10 and 20, one between 20 and 30, nine between 30 and 40, fourteen between 40 and 50, and ten between 50 and 60. There was a history of gout in seven, obesity and diabetes once each. The period of unconsciousness never lasts more than a minute or two, and there is no known fatality from this cause. The spasm as described occurs in the course of bronchitis, and it seems to be a sudden inhibition of the action of the brain, a reflex consequence from peripheral irritation of the superior laryngeal nerve. The disturbance in the circulation in the brain, to which some attribute the ictus, is only an accessory factor, Jeanselme believes. In treatment and prevention, the main point is to reduce the excitability of the pneumogastric system, and for this atropin is required. He gave small daily doses of atropin to his two patients, and there was no further ictus and the spasms of coughing were much attenuated. Persons subject to these seizures should take atropin during periods when they are inclined to cough violently. They should also lie down at once, to avoid a fall, whenever they feel the tickling in the throat, severe coughing spasm and mist before the eyes, warning of the impending ictus. Siredey has reported the case of a healthy robust physician of 54 who had a slight cold, and in drinking a cup of tea "swallowed a drop or so the wrong way." This induced a violent coughing spasm, and he rolled from his chair to the floor, entirely unconscious for a minute or two. There was slight malaise afterward and he vomited, but then resumed his daily work as usual. There has been no repetition of the attack during the five years to date.

Drug Medication

"The average physician's slavery to drug medication is difficult for intelligent minds to understand. It is too closely associated with the methods of dishonest quackery to be comfortable under scrutiny. The majority of medical prescriptions call for compounds absolutely lacking in specific or even general influence upon disease processes, and yet how rare is the physician who after examining the patient, and realizing that drugs can be but a false help, frankly gives his patient truly helpful advice, advice properly influencing his personal habits, which will, if followed, produce real cure. Many physicians satisfy their patients' almost superstitious desire for medicine and their own knowledge that there is no drug to cure, by administering what is technically termed a placebo, a harmless inert substance which contents the sufferer until nature accomplishes that which the physician is unable to helpfully modify by pill or potion. How seldom the physician takes his patient into his confidence and explains the modus operandi of such treatment. So the fetish of drug dependence, strong in the physician, lays an even heavier hold on the laity. This would prove but comparative damage if all medicine were innocent placebos, but in his armamentarium, the physician has medicaments of a potency irresistible for good, but likewise fatal for damage, drugs which for the time will stay the trembling hand and whip the faltering nerves into activity, which will still the small voice of discomfort, rob weariness of its weakness and lull pain and anguish into drowse and dreams. Weak and ignorant human nature clutches at these artificial comforts, little realizing or caring that too often the fire of disorder has but temporarily been checked with new fuel, to soon break out the fiercer. How few physicians frankly and firmly show their patients the common relation between drug taking and character weakness? How often do they make clear to impatient sufferers that the help given by drugs is but fleeting and that too often dodging the corners of discomfort is the first step toward the death of will? How rarely is the physician's influence strong and wholesome in inspiring the patient with his superiority to circumstances. How seldom does he quietly and hopefully explain the nature of the disorder and its rational, logical handling without habit-producing or will-wilting poison, and show him how he may by passing through a few hours of temporary discomfort learn that profound lesson of will and health which will be his future protection. The contributions of medical weaklings to the great aggregate of damage caused by unwise drugging are mentioned with shame. As a profession, doctors, in addition to harmful drug use, fail in their higher usefulness through a willingness to nurse and coddle unnecessary suffering, and through many popular, though questionable arts of superficial sympathy, not only maintain but produce invalidism. So much of the waste of sickness of today grows out of self-indulgence that it is humiliating to see our men of medicine pampering the weaknesses underlying these human derelicts.

"It is truly a serious charge to make against one's own profession, that in the practice of its art, it is aiding and abetting the very invalidism which looks to it alone for cure. Could every doctor fill his patients with some measure of manly contempt for comfort, safety and ease, and inspire each of his ill ones with a larger and nobler conception of the blessing of transient suffering manfully faced, as compared with the misery of self-pity which comes when a human being surrenders all that stands for personal victory and self-mastery to a craven hour of ease, then would the days of much useless invalidism be numbered. Meanwhile, the stronger, wiser and truer of the medical profession will be found working shoulder to shoulder with all teachers of wisdom in that noble and stimulating task of supplying wills for the will-less."—Robert S. Carroll, M.D., the *Scientific Monthly*, January, 1916, p. 79.

The Public and Mental Fads

In a public address given recently in Philadelphia (*Old Penn* Weekly Review, Dec. 18, 1915) Dr. William Pepper, dean of the University of Pennsylvania, School of Medicine, thus calls attention to the manner in which the public are attracted by the various fads of drugless healing parading under high-sounding titles:

"From the existing medical schools we may expect a constant improvement. The only menace to medical education in this country lies in the fact that the American public seem to fairly welcome each and every new brand of drugless healing. No matter how illiterate, how untrained in every branch of knowledge tending to enable them to diagnose disease, if these quacks but claim to be the exponents of a new cure our gullible public flock to their offices and often pay high for the folly. If uneducated individuals are to be allowed to spend but a few weeks or months, or to take correspondence courses to acquire a sufficient knowledge of the latest variety of drugless healing to enable them to go forth and treat their fellowmen, while regular practitioners of medicine must have graduated from a four-year high school and then have spent one or two years in college and four years in a medical school, then danger is near, and medical education will still need reform."

Cancer Statistics in the United States

According to a recent bulletin issued by the United States Census Bureau, a special report on deaths from cancer in the United States during 1914 is in preparation. It will be prepared under a new plan of using the figures gathered by the census bureau. The bureau has not undertaken special research work that will duplicate the work of any other institution or laboratories investigating cancer, but this report should result in a marked improvement in the mortality statistics in the way of greater accuracy and more detail. On the suggestion of the American Society for the Control of Cancer, the figures in possession of the bureau will be more thoroughly analyzed and listed under more titles than those previously employed. The report will consist of tables showing deaths from cancer according to the site of the disease, age, sex, color, nativity and marital condition, covering the registration area, the several registration states and the usual subdivisions. The publication of this report, it is believed, should bring out new and useful information as to the prevalence of the disease in the United States, and thereby contribute to a better understanding of its controllable features.

Medicolegal

Jurisdiction and Review Where License Revoked

(Thompson vs. State Board of Medical Examiners et al. (Colo.), 151 Pac. R. 436)

The Supreme Court of Colorado affirms a judgment dismissing a writ of certiorari bringing up the proceedings of the board revoking the petitioner's license to practice medicine because of the alleged procurement by him of a criminal abortion, according to findings of the board. The court says that counsel for the petitioner asked the court to examine the evidence to determine whether the board had jurisdiction, contending that the only ground on which his license could have been revoked was that he had procured a criminal abortion, and that there being insufficient testimony to prove that fact, there was a lack of power to hear and determine. But the board is by statute invested with power to revoke a physician's license for the act of which the petitioner was found guilty, and where a sworn complaint is filed with it charging such offense, that gives the board jurisdiction of the subject matter, and when the person against whom the charge is made appears in person and by attorney and contests the proceeding on its merits, that gives the board jurisdiction of the person. Under the statute the duty rested on the board, after it had received the evidence as to the guilt or innocence of the petitioner in respect to the offense charged, to decide whether or not it was sufficient to convict. It might be that the board erred in its decision on that question, but that was a matter which went exclusively to the merits of the case and did not bear in the slightest degree on the question of jurisdiction. Where, therefore, as in this case, the record proper shows jurisdiction in the inferior tribunal, the authorities are practically unanimous that on certiorari the inquiry cannot be extended to a review on the merits, but that on every question except the one of power or jurisdiction the action of the inferior tribunal is final and conclusive. Where the law does not require the inferior tribunal to preserve the evidence taken before it, on which it bases its action, such evidence does not become a part of the record to be certified up to the reviewing court on certiorari, and the findings of the tribunal based on such evidence cannot be reviewed. Contention was made and argument indulged in to the effect that the board greatly abused its discretion in revoking the license. Assuming for the purposes of this opinion, but not deciding, that this question was one which in a proper case might rightfully be urged, in the absence of the evidence which the board had before it the court was unable to see how that matter could be considered or intelligently discussed, much less determined. There was no legal duty on the board to preserve the evidence offered at the hearing, and there was nothing in the record to indicate that the petitioner asked to have it preserved, or requested an opportunity to preserve it himself. Under such circumstances he plainly was in no position to urge a reversal of the judgment of the court on the ground of abuse of discretion, as there was absolutely nothing here on which the court could predicate such action.

Liability for Death of Hospital Patient Claiming to Have Drunk Mercuric Chlorid Solution

(Wilbur vs. Emergency Hospital Association et al. (Cal.) 151 Pac. R. 155)

The District Court of Appeal of California, Second District, reverses a judgment obtained by the plaintiff, a widow, for the death of her son 18 years old, alleged to have occurred as a result of negligence on the part of the defendants while he was in the Emergency Hospital Association's hospital, to which he had been taken while suffering from an attack of pneumonia. The court says that for about a week he had a special nurse. When she took charge of him, she prepared a solution of mercuric chlorid, which was kept in a small glass on a chiffonier in the room, to be used for disinfecting the thermometer. When the condition of the patient apparently justified dispensing with the special nurse, she left the glass containing the solution on the chiffonier. That night the patient was restless, and about 2 a. m. was discovered getting back into bed, when he said that he had drunk "that green stuff." The chiffonier was so located as to require him to walk about seven feet from his bed to reach it. The contention of the plaintiff was that her son's death was due to poisoning from drinking the mercuric chlorid solution, rather than to a recurrence of acute pneumonia due to a relapse. It may be conceded that, considered as an abstract question of law, it was negligence to have the mercuric chlorid solution in the room where it could be reached by the patient. The question, however, was: Did such negligence contribute to or cause his death? Clearly, if he did not drink the solution, his death could not be attributed to such negligence, however gross it may have been. The condition of the patient after the alleged taking of the solution was not accompanied by symptoms shown, without contradiction, by reputable physicians and nurses to manifest themselves in cases of such poisoning. None of these, except the vomiting, manifested itself in this case, and that, as it clearly appeared, was due to the administering of whites of eggs as an antidote. Other symptoms exhibited, such as a high degree of temperature and greatly accelerated heart action, were conclusively shown to be inconsistent with the theory that the patient died as a result of taking a poisonous solution of mercuric chlorid. The disappearance of the solution, assuming that it was of poisonous strength and quantity, was just as consistent with the theory that it was thrown out of the window as it was with a theory that the patient drank it; indeed, more so, since had he drunk it the effect of so doing would have manifested itself in certain symptoms, none of which was exhibited.

Marriage Not Annullable for Concealment of Belief of Taint of Hereditary Insanity

(Allen vs. Allen (N. J.), 95 Atl. R. 363)

The Court of Chancery of New Jersey dismisses a bill filed by the complainant, who sought a decree annulling her marriage to the defendant on the ground that at the time of her marriage the defendant knew that he was afflicted with a taint of hereditary insanity, and with that knowledge stealthfully concealed the fact from the complainant. The court says that at the time of the marriage the defendant was a graduate physician 31 years of age. About two years thereafter he performed an abortion on his wife, without her knowledge. This occasioned a confession by him that his determined avoidance of offspring was made necessary by reason of his having inherited insanity, and that he had concealed his affliction at the time of his marriage, knowing that his disclosure would have prevented the marriage. About six years after his marriage he became violently insane and had thereafter remained in that condition. The only evidence that the defendant's insanity was hereditary, aside from his own belief, was to be found in the opinion of a physician to that effect, which appeared to be based chiefly on the present symptoms of the defendant and the circumstance of insane collateral relatives. The court holds that the relief here sought must be denied in any event for want of adequate proof of the fact that the defendant was at the time of his marriage afflicted with a taint of insanity which would have been inherited by his offspring. The defendant's confession of his belief to that effect could not be properly accepted as sufficient to establish the fact, and the basis of the other physician's opinion in the matter was too uncertain. The fact must be determined with reasonable certainty to justify a decree of that nature. Moreover, the court thinks that it will be found that, in the absence of statutes specifically authorizing a decree of annulment, or declaring the marriage unlawful at the time it was contracted, no satisfactory authority exists to support the view that a marriage contract, voidable only, can be annulled by a court of equity for fraudulent concealment by a party touching his or her physical condition, except in the extreme instances of disease of either party of a nature to render contact seriously dangerous to the other, or pregnancy of the wife. The importance of healthful offspring cannot be overestimated, but that consideration appropriately belongs to the legislature.

Society Proceedings

COMING MEETINGS

American Medico-Psychological Association, New Orleans, April 4-7.
American Urological Association, St. Louis, April 17-19.
California State Medical Society, Fresno, April 18-20.
Georgia Medical Association, Columbus, April 19-21.
Louisiana State Medical Society, New Orleans, April 18-20.
Missouri Valley Medical Society, St. Joseph, Mo., March 23-24.
North Carolina State Medical Society, Durham, April 18.
South Carolina Medical Association, Charleston, April 18-20.
Tennessee State Medical Association, Knoxville, April 4-6.

ANNUAL CONGRESS OF MEDICAL EDUCATION, PUBLIC HEALTH AND MEDICAL LICENSURE

(*Concluded from page 599*)

FEDERATION OF STATE MEDICAL BOARDS OF THE UNITED STATES

A Plan for the Regulation of the Practice of Medicine: What the Federation of State Medical Boards of the United States Could Accomplish

DR. O. V. HUFFMAN, Brooklyn: The federation could help to bring about uniformity in the methods, standards and requirements of all state medical boards. The much desired reciprocity between the various states in endorsing each other's medical licenses would naturally follow such uniformity.

Each state board is urged to accept and bring about the necessary changes so as to permit them to grant licenses to graduates of acceptable medical colleges without examination. The federation could prescribe the requirements which would have to be met by a medical college to be acceptable, two years of study in a college of liberal arts for admission, and a satisfactory four year medical course. It was suggested that the federation ask the United States Bureau of Education to provide the experts and inspectors necessary for publishing a list of acceptable medical colleges.

It is suggested also that state boards provide examinations for all applicants who have not been educated in the prescribed way. Other suggestions are that state boards revoke a license whenever the holder has been proved morally or professionally unfit to practice — such revocation to be accepted by all state boards, and that the boards put a stop to all incentive to quackery by getting the medical profession remunerated on such a basis that it would be to its direct interest to keep its clientele in sound health. To do this a scheme for a compulsory sickness insurance was suggested. It was stated that the public could not be safeguarded against incompetent practitioners until the practice of medicine was put on a sounder economic basis. Any scheme for compulsory insurance which provides adequate compensation to the medical profession and at the same time relieves wage earners of the great burden of doctors' bills ought to be welcomed by all concerned. If each of the 30,000,000 wage earners paid $2.11 a year, we should have a sum equal to the present aggregate income of the whole medical profession; and in addition the profession could still have the fees collected from patients with incomes of $1,200 or over. In general, the public does not realize how miserably underpaid the medical profession is. It does not seem to be known that doctors generally are not paid for their services given in dispensaries or in hospital wards.

Heretofore, whenever the economic situation of the medical profession has been discussed, it has usually been stated that there are too many doctors. Investigation shows that in general the medical profession is not overcrowded, and that a physician cannot properly care for more than an average of sixteen patients in eight work hours. Statistics compiled by the Industrial Relations Committee show that 2.5 per cent. of the population is constantly sick or disabled, which makes an average of nineteen patients per day for each doctor.

Regulation of Drugless Practitioners

DR. GEORGE H. MATSON, Secretary of the Ohio State Medical Board, Columbus, Ohio: Laws to regulate the practice of medicine are largely matters of education. Advancement in existing medical practice laws should be anticipated the same as we anticipate progress in other educational laws. There should be no place for special privileges. The right to treat human ailments should be given only to those who by an educational test have been proved to be properly qualified. The best method of meeting present conditions is to provide for the regulation of all who in any way practice the healing art. Having begun with the restrictive plan which has led to multiple standards, we should now provide not only for present but also for future practices. The Ohio State Medical Board obtained advance information last year that two or more bills were in preparation for introduction which would, if enacted, establish other standards for medical practice in Ohio. To preserve the integrity of our own medical practice act, further legislation was obtained authorizing the state medical board also to examine and register all persons desiring to practice a limited branch or branches of medicine or surgery, and to establish rules and regulations governing such limited practice. Holders of limited practitioners' certificates are prohibited from treating infectious, contagious and venereal diseases, from subscribing or administering drugs or performing major surgery. Certificates must be recorded with the probate court the same as those of physicians and surgeons, and may be revoked for the same reasons, and also for violations of the rules and regulations established by the board governing the practice. The definition of the practice of medicine is unchanged, and the penalty for violation remains the same and the fee for examination the same. Reciprocity is provided for. We are not prepared in Ohio to state definitely whether our recent enactment will prove a success or failure. Since the limited practitioners have agreed to the educational program adopted, we cannot believe that we shall suffer as much during the next ten years as we have during the past ten. The public will not reap any benefits until all these applicants for license are required to demonstrate their ability to diagnose diseases, which is now essential.

Standardization of Hospitals

DR. JOHN M. BALDY, President of the Pennsylvania Bureau of Medical Education and Licensure, Philadelphia: The necessity for the standardization of hospitals has arisen from the demand of the profession for the intern year. If the medical student should have an intern year, it follows, as a matter of course, that hospitals must be taken in hand as well as medical schools so that the time of the intern will not be wasted. This year of time should be of value to him and of ultimate value to the community. There are certain hospitals that have anticipated the needs of the time and are perfecting their plants, but they are few and far between. The hospitals are governed by boards of managers; they have superintendents in charge, many of them trained nurses; we have not pointed out to the boards of managers wherein these institutions are deficient. We have not pointed out to them that certain things are absolutely essential for the successful management and running of these institutions. Boards of managers are business men and have not received very kindly the suggestions from doctors, the progressive men on hospital staffs, on account perhaps of lack of funds. The advice and suggestions of such men would enable them to bring up the efficiency of the various departments in these hospitals and see that they are manned by competent men. If the intern year is to be one worth while, then hospitals should be standardized with reference to equipment and facilities for making the intern year worth while.

Discussion on the National Board of Medical Examiners

DR. C. E. CANTRELL, Greenville, Texas: The protection of the people of a state is laid at the door of the governor. This is true of most, if not all, states. The governor appoints the board. His office is a political one. It is the duty of the board to prevent men from entering on the practice of medicine who have not been properly educated and who are not

qualified. Where is the difference between the examination that will be given by this national board of examiners and its staff and an examination of any first class university medical college? Why give them a better certificate than the Johns Hopkins? It seems to me that great danger lies in multiplicity of standards.

DR. ARTHUR M. HUME, Owosso, Mich.: Every member of a state board should think as to what he considers his duty. As a representative of the Michigan state board, my primary duty to the people of the state of Michigan is so to aid in administering medical affairs in the state that all of the people will receive the most effective service from the medical profession in that state. According to the opinion of the attorney-general of Michigan, we cannot as members of the state board recognize the certificates of a national board.

DR. T. J. CROWE, Dallas, Texas: On such a national board, let us have three federal men, and twelve representatives from the Federation of State Medical Examining Boards of the United States. Let us call it a federal board, so that we know what we are getting. It seems to me, starting with six men picked from the federal service, and only three men from the state boards is a mistake. There should be a larger representation from the Federation of State Medical Examining Boards of the United States.

DR. E. J. MCKNIGHT, Hartford, Conn.: It is a good thing to have a national medical examining board. I have no criticism to make of its personnel. If the Council on Medical Education should report favorably on this national board at the next session of the American Medical Association, I shall vote for it.

DR. S. L. JEPSON, Wheeling, W. Va.: The national board has placed the standard too high. The examinations held by the different public services are much more rigid than those held by state boards. When this high standard is announced through the medical journals it will lead to the failure of this national board.

DR. H. W. ABRAHAM, Appleton, Wis.: The state board of Wisconsin has the greatest confidence in this movement for a national board. When the matter was published in THE JOURNAL of the American Medical Association, and the board was named and a résumé of the standards exacted, our board as a unit voted to accept the licentiates of this board if in every way they came up to the standard required in Wisconsin.

DR. JAMES W. HOLLAND, Philadelphia: The argument in favor of a national board from the standpoint of the army and navy and Public Health Service was not simply to make it an adjuvant to the recruiting departments of the army and navy. It is very likely we are about to enter on a system of preparation for war which will necessarily include a large body of trained medical men who, by the most varied and searching tests, are known to be qualified to take care of our young men before and after they have been on the firing line. They are to be in the reserve corps, and it is not simply those in the standing army, which is relatively small, but in that army which we may be called on to summon at any time and which may require thousands of men.

DR. W. T. GOTT, Crawfordsville, Ind.: The weakest spot in our system of legislative enactments is the lack of uniformity, but this is the first time to my knowledge that a proposition has been made to give legislative functions to a voluntary board. If that doctrine were applied to other matters in which there is a lack of uniformity in state legislative matters, we would have voluntary boards instead of legislatures and congresses. While such a body composed of distinguished educators would perhaps be better than anything we now have, it is contrary to the spirit of our government.

CHARLES WILLIAM DABNEY, President of the University of Cincinnati: I am glad that this national board is voluntary since it is not legal. Even though a single state may not accept its certificates, I hope this board will go ahead and give us a standard of medical education such as is established by the Johns Hopkins. The people of this country need it.

DR. H. H. GRANT, Louisville, Ky.: The object of this national board is to give every ambitious young man the advantage and opportunity to get the approval of the highest tribunal that can be established. It gives those who hold certificates from this board prestige everywhere in the United States.

DR. WALTER L. BIERRING, Des Moines, Iowa: There has been criticism with reference to the manner in which this board is constituted; nevertheless its purpose is in keeping with what the Federation of State Medical Boards has been discussing and working for since it was organized. I presume that the real purpose of this board will be to standardize examinations. These standards may be a little too high, but they will, at least, establish a standard for examining licentiates to which all states can approximate. It would appear that this is a pioneer movement to which we should all subscribe.

DR. ALEXANDER MARCY, JR., Riverton, N. J.: New Jersey is heartily in sympathy with this movement for a national board. We believe it is a step in the right direction. I am glad indeed to give my unqualified approval to this movement, to the personnel of the board, and to what it hopes to do.

DR. J. M. HOWELL, Dayton, Ohio: I will use what influence I can in favor of this national board.

DR. ISADORE DYER, New Orleans: The board has submitted its case to representatives of all sections of the United States and to men who stand for all phases of medical education and state medicine. The members of the board in coming before this aggregation of intelligent men do not wish them to misunderstand their motives in presenting this case. The board has been organized for the specific purpose of submitting and putting through a standard of medical education. The plan which they have submitted has been devised by a comparatively small group of men who have acted with their best intelligence.

The discussion tonight has been of the sort which was to be expected. No movement which stands for progress can succeed without reasonable objection. If this body tonight had had no discussion and had unanimously endorsed the board, I believe some of us would have felt the board was not nearly so strong either in its motives or methods as we had hoped it might be. The opposition to it speaks for its strength. There is no member of the board who does not welcome honest criticism and honest suggestions with a view to improving its motives and its methods. If it is possible to put the board on a legal basis, it will be done. It is the intention of the board to solicit the best advice it can get to that end. If it is not possible to place it on a legal status, I believe I speak for the board when I say that it is the intention to go ahead on the standard which it proposes until it wins its way by the right and justice of its function.

JOINT SESSION OF THE COUNCIL ON HEALTH AND PUBLIC INSTRUCTION AND THE FEDERATION OF STATE MEDICAL BOARDS

Medical Practice Acts

DR. HENRY B. FAVILL, Chicago: We come today to the discussion of the practical decision on two very important topics, one the formulation of medical practice acts, a subject hitherto characterized by disharmony, lack of symmetry and lack of consistency. Today we are reasonably free from the reservations which we might have had with reference to our previous utterances, and we are more nearly at the point of being able to give definite advice and guidance with regard to medical practice acts than ever before.

The Council on Health and Public Instruction has been conducting for a year a very careful scrutiny, study and survey of boards of health of the various states, with the results that we are able to produce today not a perfect, but a very comprehensive survey of the whole status of health board subjects of this country.

It is uphill work for the medical profession to project its view on the general public. The reasons for this are many; but the fact remains that the heaviest load we have to carry, sooner or later, is in enlisting interest of the public in its own business and for its own welfare. It is rather an unusual experience for this Association to find a strong cooperation on part of the public or representatives of the public (non-medical public) in the effort which it is attempting to put forth strictly and solely for the benefit of the public.

When Ex-Governor Hodges was governor of Kansas, I think I am not exaggerating when I say he was the first governor who ever distinctly saw the point and assumed responsibility for the medical legislation of his state. He was the first governor that I know who ever attached sufficient importance to the subject to appoint a commission to study carefully the question of medical practice acts and report to the administration. His commission reported a bill which they endeavored to have enacted. The bill in the form in which it was drawn did not pass the Kansas legislature, but this in no sense detracts from the efforts of Governor Hodges. While that legislation in Kansas was pending, Tennessee came to the front with an effort to pass a medical practice act, applied to this Council for advice on the subject, was given the information as coming from Kansas, and while Kansas was considering and finally rejecting their model bill, as the result of a very remarkable campaign Tennessee went ahead and passed practically the same bill.

The Provisions of a Model Medical Practice Act

EX-GOVERNOR HODGES, Olathe, Kansas: My experience as a member of the legislature and as governor has demonstrated to me that the laws on the practice of medicine are a jumble of contradictions and confusions and are the products of minds scantily conversant with the fundamentals of a recognized science that differentiates between scientific investigation and primitive belief in witchcraft. Believing that there should be but one educational standard for all who may treat the sick, a commission of three physicians and two laymen was appointed in Kansas to investigate this subject and draft a bill providing for a single educational standard for all persons desiring to treat the sick for compensation. The fact that certain cults and sects do not use drugs does not change the fact that they are practicing medicine, so long as they undertake to diagnose and treat human diseases and injuries. The man who assumes to have knowledge fitting him to treat human diseases should be required by the state to comply with definite educational conditions for the protection of the public. The state in appointing a board of examiners assumes an obligation for the protection of the health of its citizens and should see to it that the licenses which it issues to all men have a uniform value. There is no justice or consistency in the state requiring a physician to prepare himself by years of study and to prove his worth by passing a rigid examination and then admitting others to the same privilege after only a few weeks of preparation. The commonwealth should not allow doctors of one school to practice on any easier acquirements than those of another school. The patient has a right to be attended by a physician of his own selection and the state should not be a party to any differences of opinion between opposing schools nor impose any unjust regulations on any school, but it should require the same degree of educational preparation of all applicants. The people should safeguard these conditions for their own protection. The easiest way to do this is to require of all persons who desire to treat the sick for compensation, a preliminary education including a high school course at least, and such medical training as will give each practitioner a knowledge of the structure of the body and its afflictions. Regulatory laws should not be designed to protect any particular group or school.

One Year's Experience with the New Tennessee Law for a Board of Preliminary Examination

MR. IRBY R. HUDSON, Nashville, Tenn.: At the last meeting of the legislature, a law was enacted creating a board of preliminary examination. The medical practice acts of Tennessee permitted practically any one to appear before the examining boards and take the examinations. So far as I can learn, no one was excluded from the examinations because of a lack of education and equipment. Many students of our medical colleges during their sophomore and junior years have appeared before these boards and have satisfactorily passed the examinations.

The bill provides for a more or less new phase of medical legislation. The real purpose of the bill is for the protection of the state against untrained men. The members of the board of preliminary examination are not trained experts in the medical field, none of them have even so much as attended any medical school, but they are school men of academic training who are employed in daily considering school problems. We do not pass on the exact medical knowledge of the student. We are to investigate whether the candidate has had sufficient training in reputable schools to warrant us in allowing him to practice.

Many of the states have laws already which require higher educational standards, but in Tennessee we cannot raise our standards higher for the reason that our best medical schools until two years ago did not require for entrance more than the four years of the high school work. But now that our colleges have raised their standards, our law can raise its standards. The leading schools now require one year of premedical work for admission, and our law makes the same requirement after 1919.

Our law can easily be amended for higher educational requirements as our local institutions set higher standards for the state. We are taking the medical department of the state university, as it is now organized, for our 1919 standard. This institution is ranked as an A college by the Council on Medical Education.

Our law provides no definite compensation except a fee of $5 an applicant, and this in many cases was to be refunded. As it worked out this first year, we have had about 100 men apply to us. At $5 an applicant, we should have only $500 to pay all of our expenses. With this amount you can readily see how much investigating could be done, which virtually meant none outside of our state.

SYMPOSIUM ON WHAT SHOULD BE THE PROVISIONS OF A MODEL MEDICAL PRACTICE ACT?

Important Features of a Model Medical Practice Act

DR. HORACE D. ARNOLD, Boston: A great deal depends on our interpretation of the word "model" in this connection. It should not, I believe, be interpreted to mean "ideal," but rather to indicate a "pattern" which is practicable for general application at the present time. Such an act, which is capable of general adoption, would be a longer step toward uniformity than would a more ideal measure which few states could adopt. We should aim to put this act on as high a plane as is practicable at the present time, but not to get too far in advance of a standard which may be adopted by a majority of the states. Some states are already in advance of such a model practice act as I advocate. We should not ask them to go backward, but rather encourage them to maintain their high standards, so as to encourage other states to come up to their level.

One of the most important features of a model practice act should be a definition of the practice of medicine, broad enough to include all forms of treatment of the human body, in health as well as in sickness or injury, by any method whatever. In this respect the model act, submitted for discussion a year ago, is deficient. All who wish to act under this definition should be licensed by some proper state authority, and all others should be prohibited from acting in such capacity, with penalties for the violation of this law.

We must somehow divide these various practitioners into classes according to the education and training that may properly be expected from them, for any regulation must have an educational basis. The first broad subdivision should come between those who may be expected to make a diagnosis, and those who ordinarily would not do so. Among the latter are midwives, nurses, masseurs, chiropodists,

optometrists and those employed in hydrotherapeutic establishments.

The central board of registration might well consist of seven members, as suggested last year, but I think they should all come from the class of licensed practitioners who are recognized as qualified to diagnose disease.

For all forms of practice which require a diagnosis there should be a uniform minimum educational requirement, whatever form of practice the licensee is to follow. Owing to the fact that all forms of so-called drugless therapy should be included, I do not think it desirable to have the requirements and examinations uniform throughout, with the exception of therapeutics, as is sometimes advocated.

What should be the minimum uniform requirements? They should include first a standard four year high school course, or its equivalent. The minimum professional education should be at least three years spent in a school approved by the central medical board, with evidence of satisfactory work in human anatomy, physiology, chemistry, pathology, bacteriology, symptomatology, diagnosis of disease (medical and surgical), hygiene, sanitation and preventive medicine, including the recognition of contagious diseases. A fourth year should be required, devoted to therapeutics and clinical experience in the special form of treatment for which the license is to be granted, under such instruction or supervision as is acceptable to the central medical board.

The premedical requirements should include, in addition to the four year high school, one, or preferably two, years of college work including courses in physics, chemistry, biology and a modern language. The act should specifically state the amount of time to be spent in each of these subjects, as in the requirements of the Council on Medical Education.

A Model Practice Act

DR. WALTER L. BIERRING, Des Moines, Iowa: A national medical registration act is not possible in this country without an amendment of the federal constitution, and in seeking another solution it is found in the adoption by the various states of a uniform practice act, based on an equalization of standards, which will make reciprocal endorsement between each of the several states a reality.

In Canada this matter has culminated in the creation of the Medical Council of the Dominion of Canada, which constitutes a central examining board, and thus tends to more uniform medical requirements in the several provinces of the Dominion. Similar good results in standardization are to be expected from the proposed national board of examiners. During the past twenty-five years the Conference of Commissioners of Uniform State Laws has been engaged in preparing uniform laws on the more pressing subjects to present them to the legislatures of the various states for enactment, which illustrates that in other matters besides medical practice acts there is still a lack of uniformity in state regulation.

While recognizing the lack of uniformity in standards that prevail, when statistical data are collected and compared with conditions a decade ago, a very marked improvement is everywhere noticeable. At that time a preliminary education of four years high school or higher was required in only ten states, while now provision exists in thirty-seven states, and similar changes have come in other directions. For these better conditions the Federation of State Medical Boards of the United States is deserving of some of the credit.

A model practice act should define clearly the preliminary education, the fundamental medical training, the character of the licensure examination, and besides should contain a clear and definite statement of the method of procedure for the revocation of the license issued. A license to practice should be held by the recipient only during good behavior.

Basic Provisions of Model Medical Practice Acts

DR. W. J. MEANS, Columbus, Ohio: The first fundamental provision that should be written into every medical law should be based on educational accomplishments, both cultural and professional, and the standard should be uniform for all persons who desire to practice medicine. There is no place in a true educational standard for special privileges. A standardized educational test for practitioners does not interfere in any way with the right of the individual to choose his own medical adviser, but does guarantee, so far as the matter can be determined, that he will not be imposed on. It is certainly the prerogative and the duty of the state to prescribe educational requirements for those who are asking the privilege to practice medicine on its citizens. I believe that, fundamentally, this is the most important provision which should go into every medical practice act.

Speaking of special privileges, there is no good reason why an individual who wishes to practice osteopathy, homeopathy, eclecticism, chiropractic or any other practice should object to being educated to the same degree as the one who wishes to practice regular medicine. Unfortunately, legislators are impressed with the argument that drugless healers, the osteopaths, and all others who lay claim to some peculiar way of curing disease, have a perfect right to do so as long as the people want them. This has led to the exemptions and special privileges in our medical laws.

The next important step is uniformity in the medical laws in all the states of the Union. This perhaps cannot be reached until the national government enacts a medical practice act. In the absence, however, of a national law standardizing the practice of medicine, we must continue to deal with state regulations and through education of the public bring about the desired reforms. An effective law is one that expresses the sentiment and conscience of the people.

An educational test is one of the basic provisions that should be written into every medical practice act, and it should apply to all applicants, regardless of sect, cult or creed. There should be only one administrative board, the members of which should be selected from representatives of higher education. Applicants should be required to take an examination in all the fundamental subjects of medicine, and to pass each with a creditable grade; failing to do so, they should not be permitted to be reexamined until they have pursued and completed a course in an acceptable medical college. There should not be incorporated exemptions or privileges that may tend in any way to lower the minimum educational standard enacted in the law or fixed by the medical board.

Discussion of Symposium on What Should Be the Provision of a Model Medical Practice Act?

DR. JOHN K. SCUDDER, Cincinnati: I cannot see the necessity or philosophy of having the board made up of four non-medical men, ex officio. I fail to see why the president of the state agricultural college should have anything to do with the licensure of physicians. I feel the same way in regard to the president of the state normal school, and medical boards do not recognize attendance in normal schools as being related to academic subjects.

As to the standard of entrance qualifications, it should be specifically stated in the law, and not be in the power of the board to make it either too low or too high, but it should be put in the law specifically as the present average standard, and then as necessity calls for it, it should be raised.

MR. THOMAS S. HOGAN, Attorney for Illinois State Board of Health, Chicago: I believe there should be a uniform practice act. It should be clear and without equivocation, and it should be thoroughly understood by courts and by juries, and the same law should exist in all of the states of the United States. No matter how good the law may be that you have devised, unless all its provisions are strictly enforced, it is of no avail. In Illinois there are many violations of the law. For the entire state of Illinois the sum of $1,500 a year is allowed for the prosecution of all violations under the present medical practice act. It is up to the members of the medical profession and the associations connected with the medical profession to impress on the legislators that this law is an outrage on the statute books; that it is against the interest of the profession and the people, and no matter how good your model medical practice act may be, unless you can enforce it properly in the courts and make it as clear as it can be made, it will be of no avail.

DR. C. E. CANTRELL, Greenville, Texas: It must be perfectly apparent to all present that we cannot enforce these laws unless we have the constabulary behind us. Notwithstanding the fact that the law may lie for months and years on the statute books, unless the district attorney and other proper authorities of the state take it up and enforce it, there will be gross violations, and finally there will be objection made to this or that section, and the matter will have to be submitted to district attorneys to consider and to enforce the law. We find it so in Texas, and we were among the first to have a law that was made to include all of the schools of medicine on our board. We ought to recognize in the eclectics, in the homeopaths, and in all of the so-called sects important factors in educating the people. I am a defender of the state boards because they gave us our first relief from quackery.

DR. JOHN A. WITHERSPOON, Nashville, Tenn.: We should try to educate the people that medical practice acts are not to protect the medical profession because they spring from the medical profession, but to protect the people. That is the object primarily of all medical legislation.

DR. S. L. JEPSON, Wheeling, W. Va.: In West Virginia we are fortunate in having a physician for governor. In the last legislature we had ten physicians, and we had as chairmen of committees on sanitation and medicine two very high-minded, well educated doctors who were intensely interested in the passage of a bill which we considered greatly in advance of any other that had ever been on our statute books. The bill was prepared by officers of the United States Public Health Service, which created a new department of health, with a state health commissioner as its executive official, and which gives to us a council on health composed of seven men, the commissioner being ex officio a member, the right to pass regulations, and the right to legislate for the betterment of the people.

As to the enforcement of the statutes against irregular practitioners or unlicensed practitioners, the greatest difficulty we have found is in having grand juries indict these men.

DR. B. D. HARISON, Detroit: In our state, practicing medicine without a license is a criminal offense, and the prosecuting attorneys of the several counties are charged with the duty of enforcing the act. In Michigan we are very fortunate in having a governor who, in his message before the legislature, stated without equivocation that he would enforce the medical practice act; that he was entirely opposed to quackery, and he would use all the influence of his office, and that of the legislature against everybody who pretended to be able to cure or treat disease without being properly qualified to do so. He has carried that to the extreme. In the case of a prosecuting attorney who refuses to take notice of a complaint, the governor writes him for an explanation, and if he does not give a proper reason he is dismissed from office. This has had a tremendous influence for good in our state.

DR. D. C. BUDGE, Logan, Utah: It is absolutely essential that the public be educated. We have a single board in Utah made up of regulars, homeopaths, eclectics and osteopaths. We are working in harmony. I have not heard anything in this conference that would induce me to change my mind in that regard. We are working for a certain standard of education and not for sects.

DR. T. J. CROWE, Dallas, Texas: We have a mixed board in Texas, and have been harmonious in our work. Doctors themselves are to blame for not getting more out of their medical examining boards than they do get at present. Doctors organize individually themselves, but are only indifferently supporting the work of the board. Our board has worked together as a unit for the advancement of medical education and the uplift of the medical profession generally.

DR. L. E. SIEMON, Cleveland: Any model medical practice act to meet the approval of the general medical profession, on whom the practical enforcement of that act depends, must provide for protecting the individual medical public as well as the general public. In my judgment a mixed board has solved the problem as far as Ohio is concerned. No one can say that at any time have the so-called irregular elements of that board failed to measure up to the demands of the situation and to march forward in the van of progress, and any model medical practice act to receive general approval throughout the country must provide for some form of recognition of the various elements in medicine that they are supposed to license.

TWELFTH ANNUAL CONFERENCE OF THE COUNCIL ON HEALTH AND PUBLIC INSTRUCTION OF THE AMERICAN MEDICAL ASSOCIATION

Held in Chicago, Feb. 8, 1916

DR. HENRY B. FAVILL, Chicago, in the Chair

DR. CHARLES V. CHAPIN, Providence, R. I., read a paper entitled "State Public Health Organization," which will be published in THE JOURNAL.

DR. JOHN W. KERR, Assistant Surgeon-General, United States Public Health Service, followed with a paper entitled "Some Essentials of Public Health Organization," which will be published in THE JOURNAL.

Discussion on Public Health Organization

DR. HENRY M. BRACKEN, St. Paul: The question of appointment of the executive officer was discussed and the point was made that such appointments are not desirable; that one of the important functions of a council or board of health should be the appointment of an administrative officer, and this, I think, is true if we are to secure tenure of office referred to by Dr. Kerr. I think it is generally conceded that we cannot carry on efficient health work without the authority of the board or council to make regulations, and it is recognized that these regulations come under police control, and it is possible for legislatures really to transfer the power of legislating to such a body as this. One can readily understand that unless this is possible, progress in public health work is to be greatly interfered with because no legislature will formulate laws that will make it possible to administer health work as councils or boards that are more or less familiar with this kind of work.

It is hard to make the average layman and the legislator understand that vital statistics are anything more than collecting the returns of births and deaths and possibly of marriages and filing them away. They do not seem to appreciate that these things are necessarily the basis of our work. Even doctors themselves do not appreciate the importance of accurate vital statistics. The division of public health work sometimes is simply alarming. Why tuberculosis should be set off by itself as a health problem is more than any health official can understand.

The point was made whether there should be the appointment of local health officers. That is a dangerous proposition creating a political machine. Let the local people appoint their officers, but if you can arrange that the state can discharge them for cause, then the locality will have to put up other men. If they know you are going to discharge a man who is not efficient, they will be more careful in their appointments.

DR. JOHN N. HURTY, Indianapolis: There is such a thing as Nature, and then there is another such thing as human nature. It is with human nature that we have principally to deal in this work. Human nature is moved principally by self-interest, which is decidedly different from selfishness. If you wish to convince a man you must appeal to his self-interest. Only about 10 per cent. of people can think; 20 per cent. are able to think what others think, and 70 per cent. cannot think at all. Education is a great force in uplifting mankind, but you cannot educate brains that are not educable—brains that have nothing in them to educate, and that fact must be considered. The great mass of people must be forced and compelled to do that which is necessary for their own salvation.

A great deal is to be said for a commissioner of health at the head of a department of health. A commissioner of health of the state is certainly good.

In regard to the medical inspection of schoolchildren, I would rather have that term changed and say "health supervision." I am not convinced yet that the health supervision of schoolchildren should be under the public health department. It is a matter of education.

I believe in the county unit for the all time health officer, especially for our state. This is because the county is already the organized legal constitutional unit. It has certain powers given it by the constitution, powers of taxation, but if they select an all time officer they should be given that power, with the power residing in the central authority to discharge for certain well defined reasons or causes. If they do that they should be compelled to select from an eligible list furnished by the central authority. We have that draft in the law and expect the legislature to pass it.

There is a great deal of argument made for health officers who are not medical men. They do not have to make diagnoses; they take the word of the practicing physician for that. Our health officers never go behind the returns of the physician except in the most dire conditions; otherwise it would not do.

DR. WICKLIFFE ROSE, Director of the Rockefeller International Health Commission, New York: The public health business of a commonwealth is one business, and not many, and if it is one business, in the interest of economy and efficiency that business should be brought under one administration and not many. If I am not very much mistaken, we are facing what promises to be a public calamity, in that there is now a tendency in many, if not all our states, to parcel out the business of public health to a multiplicity of state agencies, and in addition to that to permit a great multiplicity of voluntary agencies to come into the state, and without supervision by the state department of health, undertake to run some portion of the state health business. We are beginning to see an influence in public health, and for that reason there is no more important thing than that this body should proceed to action and continue to act until this business, than which there is no more important for the commonwealth, shall be conceived by the people as one business and brought under one administration. Whatever belongs to health should come under the administration of the commonwealth for the public health.

In the second place, if this is a business, it is very essential that that business be properly financed. If you are going to enter on any great business undertaking that should extend not through one year, but many years and further into the future than you and I can see, I do not think you would engage in that enterprise by undertaking to supply funds for it in a haphazard way. You would not undertake to finance it. Financing is a business of itself. There is such a thing as financing the public health in a scientific way, and, it seems to me, you should appoint a committee to take up the business of financing public health, and let that committee, after mature thought and deliberation, bring back a report to this organization for consideration and, if necessary, devote a whole afternoon to a discussion of the proper financing of public health organization. Your funds must be adequate and derived from the proper sources.

One of the functions a state board has to perform is that of making rules. The rule making power by the state board is a function that is extremely important, and if the board should have no other function it should be organized for that purpose. It is a function which cannot be adequately performed by the health officer unsupported by the board. The second function is the appointment of a state health officer. So long as that man is appointed by the governor or elected by the people, you will not have efficient service. When the board comes to appoint an executive officer, it needs to have the power to select that officer from the country at large. It needs to have the power to fix his compensation and to modify it from time to time in accordance with efficiency of service. It needs to have power to keep him at his post as long as he is effective. You would not undertake to administer a big business on any other basis than that. Having selected that man, then the board wants to clothe him with authority and hold him responsible for results.

From experience I am convinced that our public health work is going to become really effective only so far as we can enlist a sympathetic and active cooperation of the masses of the people. Public health work is essentially an educational proposition, and its efficiency is going to be measured largely by the efficiency of the machine as an educational machine.

DR. CRESSY L. WILBUR, Special Agent, United States Bureau of the Census, New York: In the paper of Dr. Chapin, considerable stress was laid on the fundamental importance of the registration of births and deaths as a basis of public health work. We have been urging the point that vital statistics is absolutely the necessary basis of public health work for years and years, and this Council has devised a model law in connection with the American Public Health Association and the Bureau of the Census, which is designed to secure such results under the law as will compel the registration of births and deaths. If the model law is enforced with the penalty attached in every case of violation, I believe we will soon have complete registration of births and deaths.

DR. HENRY B. HEMENWAY, Evanston, Ill.: I can see no possible advantage in appointing a board as compared with one man at the head of the department who will be absolutely responsible to the state for the health of the state, or responsible to the community for the health of that community. He may have and should have under him, if the department is large enough, a council, but in that council he may have the advantage of experts who are devoting their whole time to the work, not men who are devoting a few days in the year to it, without paying perhaps much attention between times, but men who are devoting their whole time to the one thing—men who are best qualified, each man to speak for his own particular branch of the work; in that way the different ideas may be harmonized. In public health experience in all executive work, if you have a board for any purpose, there is some one man who is better qualified than all the rest of the members of the board in that particular line of work. If that is so, then every man who is not thus qualified is so much of a hindrance; he has got to be persuaded and shown that things are thus and so. I am emphatically opposed to the board idea.

With reference to education, attention has been given to the education of officers of health, of commissioners of health in the line of doctors of public health; but I know of no provision in any educational institution in the United States for the education of dairy inspectors or other local inspectors, and it is just as necessary to provide for the special education of these lower employees as it is for the chief officers.

DR. ALBERT W. HINMAN, Dundee, Ill.: There is not a food on the face of the earth as a food product today that contains as much filth as milk when you take it as a whole, and considering that it is produced promiscuously all over the country. We find a man here and there who is scrupulously and religiously neat enough and clean enough about his business to feel that he must furnish a clean product, but the most of them are careless, and hence the milk is more liable to become contaminated with disease-producing germs. As I view the matter, we will never get that food product produced and handled as it should be until there is a law which compels these men to furnish milk under more cleanly and hygienic conditions.

DR. CHARLES V. CHAPIN, Providence, R. I.: I was particularly pleased with one thing that Dr. Rose said about the desirability of having all public health work under one government department. That has not been so in the past. It has been scattered among different departments, and outside agencies have come in. It is our own fault. State health officers and municipal health officers, of which I am one, have been negligent. We have not done our duty, and others have been obliged to come in and stir us up. Let us take warning from the past and do everything that devolves on us to promote public health so that it will not be necessary for outside agencies to come in.

DR. JOHN W. KERR, Washington, D. C.: I wish to urge on the conference that rather than attempt at this time a com-

prehensive model law, we attempt the adoption of as many principles as we can. Let us in this matter take two bites of the cherry, and above all, I would emphasize again the providing of money and of men. Those are the sinews of war, and without them any legislation you get would be sure to fail.

PHILADELPHIA COUNTY MEDICAL SOCIETY

Meeting held Jan. 26, 1916

The President, DR. JOHN D. MCLEAN, in the Chair

SYMPOSIUM ON PNEUMONIA DURING 1915 AND 1916

Diagnosis, Complications and Treatment of Pneumonia in Children

DR. H. BROOKER MILLS: In diagnosing bronchopneumonia, three important points for consideration are the age of the patient, history of previous illness and the existing bronchitis. Three other symptoms nearly always present are increased pulse and respiration rate, and fever. Dilatation of the alae nasi and the presence of definitely localized mucous râles also facilitate diagnosis. The physical signs, which are many and varied, develop early. The most common complication of bronchopneumonia is otitis media. The prognosis is always grave, and the mortality is estimated by some at 50 per cent. The treatment is largely symptomatic, with special attention to preservation of strength and upbuilding of vitality. A room temperature of 65 F., with plenty of fresh and frequently changed air in the room, a maximum amount of nourishing liquid diet, daily colonic irrigation, daily bath and plenty of water to drink are indispensable in treatment. Counterirritation is valuable, and frequent and thorough cleansing of the nose and throat is absolutely necessary. For the cough, inhalations are preferable to expectorant mixtures. For the high temperature, I use hydrotherapy exclusively. In addition to the usual hydrotherapeutic measures, I have found of advantage the wrapping of the hands and arms to the elbows, and the feet and legs to the knees in wet cloths covered with a dry cloth, for twenty minutes, three or four times a day. My patients are never disturbed after 7 p. m., but in the event of their waking, advantage is taken to meet the indications. The natural stimulation from nourishing, well digested food, is far superior to the artificial stimulation frequently employed too early in the disease. When, however, the heart needs assistance, this should be given. I have been fortunate in having my hospital patients on a well lighted, protected porch adjoining the ward. I have made little use of the bacterin treatment. Lobar pneumonia in children is ushered in by high temperature oftener than any other disease of childhood, except scarlet fever. The onset is sudden, with high temperature, rapid respiration, vomiting, prostration and abdominal pain. For the first twenty-four hours, pulmonary symptoms and physical signs in the chest are absent; the chill, usually present in the adult, is rare in children, rigor seeming to take its place. There is practically no cough or expectoration during the first few days. Empyema is a frequent complication, and there is no relation between the amount of fluid present and lung involved. In the present epidemic of pneumonia in Philadelphia, many cases of lobar pneumonia have been observed in children below the age when expected, and these have occurred in debilitated children rather than in the robust child, as is usual. There has also been an increased tendency in bronchopneumonia toward coalescence of diseased areas, and the fever has been sustained rather than of the usual irregular and moderate type. In several cases an unusual fact has been the enormous excursions of temperature between the hours of 7 p. m. and 7 a. m. I cannot offer any satisfactory explanation of these various peculiarities of the present epidemic; possibly the virulence of the epidemic itself may be a factor in their production.

Diagnosis and Treatment of Pneumonia

DR. HOBART AMORY HARE: Consolidation of any part of the lung, whether it be due to the pneumococcus, the tubercle bacillus, or other cause, is in one sense pneumonia. Although from the etiologic standpoint all cases of pneumonia is identical, from the clinical aspect one case is as often different from another as smallpox is from chickenpox. In all cases of true lobar pneumonia, the patient is suffering from an acute, infectious disease quite as specific as scarlet or typhoid fever. In the absence of a specific antitoxin we must not treat the disease or the patient with drugs, except when definite assistance is demanded. In both bronchial and lobar pneumonia, absence of positive physical signs as a group often misleads in diagnosis. Fine râles or bronchial breathing are often apparently absent, because of the great amount of exudate present. In such cases percussion will often reveal dulness over a silent area; but even percussion may be misleading because a deep-seated consolidation may give hyperresonance on light percussion over the area affected. The differentiation of effusion and pneumonia is easy in typical cases and still easier in the textbooks, but is often one of the most difficult problems in practice. Croupous pneumonia may assault a man frankly, or as insidiously as does a sapper his enemy in warfare. The sputum may vary greatly. It is well to recall the words of Sir William Jenner, "the brighter the blood, the less the weight of the patient, the better the prognosis." To this may be added, "the higher the fever, the slower the pulse, the better the prognosis." In the treatment of croupous pneumonia, let Nature's laboratory make the needed drugs. Do not try to treat the pneumonia.

Cotton jackets and poultices are remnants of barbarism. Coal tar antipyretics are contraindicated in all instances. There is a large amount of evidence that fever is a protective process or is indissolubly connected with the protective processes. Except in cases of distinct hyperpyrexia, with the temperature above 105 F. for a long period, even cold sponging is, as a rule, to be avoided, for the patient will not react. On the other hand, an agent which tends to lower the temperature and permit oxidation, and which is as nearly a specific remedy as any we have, is cold, fresh air. I would rather employ this method in croupous pneumonia than any drug with which I am familiar. It is hard on the nurse but it is life to the patient. A frequent mistake is that of treating symptoms simply because they are not in accord with the normal state. Any attempt to force the pulse, the respiration or the temperature to the normal line is futile and dangerous. When, however, any symptom or series of symptoms becomes so widely separated from the normal as to be dangerous or to indicate the approach of danger, it should be curbed. The administration of 10 drops of tincture of belladonna, three or four times in twenty-four hours throughout the greater part of the attack of croupous pneumonia, tends to prevent complications in the vascular apparatus. Atropin and strychnin are to be kept in reserve to be used in full dose to meet threatening collapse. In cases in which there is great cyanosis, in plethoric individuals, free venesection is sometimes of advantage. Estimation of the difference between the diastolic and systolic pressures is important. A diastolic pressure of 60 with a systolic pressure of 150 shows relaxed vascular tone but a powerful heart stroke, and that cardiac stimulants are not needed; whereas, a diastolic pressure of 70 and a systolic pressure of 110 may indicate that both vascular and cardiac stimulation is essential. With the possible exception of belladonna, which is used to prevent the sudden arising of complications, I have never seen any case of pneumonia which needed the same remedy in the same dose day after day. The skilled physician will fit the drug and the dose to the need of the patient at each visit. Expectorants in either type of pneumonia are never useful until the stage of resolution is developed.

Discussion on Symposium on Pneumonia During 1915 and 1916

DR. JUDSON DALAND: One should be on the alert to diagnose bronchopneumonia in the absence of the ordinary physical signs. The Roentgen ray has shown that the disease is frequently overlooked, particularly in very young children. I have often wondered whether, in cases of bronchopneumonia with associated nasal obstructions, exposure of the patients to the outer air, thus allowing direct entrance of

the air through the mouth, is beneficial. I believe that the fatal result in many infectious diseases is often due to the lack of resistance rather than to the infection. With close study the probable degree of resistance under certain circumstances may be estimated.

DR. WILLIAM N. BRADLEY: In my experience with bronchopneumonia in children, the larger number have been of the primary type. I agree with Dr. Mills regarding treatment, except possibly in his hydrotherapeutic measures. In quite young children I find that cold water is not well borne. The initial chill of pneumonia is of more frequent occurrence in children than is generally thought to be the case. I believe that serum therapy offers the ultimate solution of the problem of pneumonia.

DR. WILLIAM EGBERT ROBERTSON: The large number of deaths from pneumonia is due to our own ignorance of the disease and of the proper method of handling it. Pneumonia usually develops in individuals with a disease focus; if not tuberculous, probably intranasal, or an old sinus disease. In some cases, beginning apparently as pneumonia, treatment of the nose will abort the disease, supporting the view that the nose may be a factor in the development of toxic forms of the organism. Whatever be the character of the pneumonia, the important element is recognition of the type, that we may some day evolve a successful treatment.

DR. H. BROOKER MILLS: I agree with Dr. Daland that there are probably many more cases of pneumonia than are diagnosed as such, and I know from experience that the Roentgen ray is a very valuable aid in diagnosis in cases in which the clinical signs are either absent or atypical. Abdominal pain has often led to the mistaken diagnosis of appendicitis. It is fair to suppose that while tuberculous areas may not have predisposed to pneumonia, these areas provide a favorable culture medium for the pneumococcus and other germs. I fail to see how it would be possible to abort a frank pneumonia by any form of nasal treatment.

DR. H. A. HARE: While recognizing the possibility of the ultimate value of serum therapy in pneumonia, I feel that that there are reasons in opposition to this solution of the problem. For example, in a large number of cases, when we are called there is already blood tinged sputum, or exudate in the alveoli. The process is in one sense complete. Furthermore, we do not know in pneumonia when the primary infection has occurred. We do know in typhoid that before a man comes to us he has been inoculated from twelve to fourteen days. The presence of renal disease in a patient with pneumonia is of grave importance in prognosis. Failure of treatment in such complication should not cast doubt on remedies useful in the ordinary case. The same is true in heart conditions. Alcohol is of value in that it dilates the peripheral capillaries, giving energy to the body and equalizing the circulation.

Report of the Pneumonia Commission

DR. DAVID RIESMAN: The Pneumonia Commission is the outgrowth of a desire to find ways and means of lessening the incidence and death rate of pneumonia, and, to study the cause, mode of spread, prevention and treatment of the acute catarrhal affections that have prevailed in Philadelphia during the present winter. A similar work was undertaken in New York in 1904, but was not carried far enough to be of material value in lessening the death rate of pneumonia. Pneumonia, of all acute diseases prevailing in this climate, is the most serious and most fatal, and the one responsible for the largest number of deaths. While the death rate from typhoid in Philadelphia has steadily fallen from 1,063 in 1906 to 111 in 1915, the death rate from pneumonia has been practically unchanged, and in some years, indeed, materially increased. In 1914 there were reported in Philadelphia 1,436 cases of pneumonia; in 1915 there were 2,744. In December, 1915, 881 cases were reported, the largest number in any one month. The number of cases of pneumonia reported does not indicate the total number of cases as, apart from the fact that many physicians do not report their cases, some of the complications of pneumonia are reported as the principal disease, the pneumonia, which is in reality responsible, being ignored. This is true of some cases of meningitis and empyema and middle ear disease. The present outbreak has shown that as an epidemic disease, pneumonia is as yet uncontrollable. It has been held for years that the germ of pneumonia is present in the mouth of many healthy persons. It seems, however, that this is not the case—that the germ actually found is quite harmless, while that causing pneumonia is virulent. This discovery leads to the conclusion that pneumonia does not develop from within, but is conveyed to the patient in some way from a previous case. The commission is also undertaking an investigation of the recent grip epidemic, and is preparing to send out circulars to industrial establishments, schools, police and fire departments, reformatories, etc., for the purpose of determining the frequency of the disease and, perhaps, its mode of spread. It also wants to obtain further light on the question whether grip predisposes to pneumonia. The commission has divided itself into a committee on laboratory work and a committee on clinical investigation. The plans of these committees are now ready. What is needed to proceed with them is an adequate appropriation by the city to carry on the work, which is not only of great importance to the city, but which may, in the opinion of Director of Health Krusen, assume a national importance.

Current Medical Literature

AMERICAN

Titles marked with an asterisk (*) are abstracted below.

American Journal of Obstetrics and Diseases of Women and Children, York, Pa.

February, LXXIII, No. 2, pp. 193-384

1 Chronic Intestinal Stasis: Report of Cases. W. S. Bainbridge, New York.
2 *Liver Function in Normal Pregnancy. J. C. Litzenberg, Minneapolis.
3 Compensatory (Vicarious, Ectopic) Menstruation; Xenomenia; Memmes Devii. W. H. Condit, Minneapolis.
4 Eclampsia and Its Treatment. W. M. Brown, Rochester, N. Y.
5 Minor Surgical Gynecology. C. E. Ruth, Des Moines, Ia.
6 *Splenic Anemia with Splenectomy. E. D. Clark, Indianapolis.
7 Rovsing's Operation for Gastrocoloptosis; Report of Seventeen Cases Successfully Operated on. G. Torrance, Birmingham, Ala.
8 Wound Dressings. D. H. Stewart, New York.
9 Quantitative Test of Abderhalden Reaction. D. D. Van Slyke, J. R. Losee and M. Vinograd-Villchur, New York.
10 Neuritis in Pregnancy. F. B. McCarty, Chicago.
11 Diaphragmatic Hernia. G. B. Miller, Washington, D. C.
12 Pituitary Extract in Labor. J. J. Mundell, Washington, D. C.
13 Respiratory Diseases as Factor in Causation of Infant Mortality. W. C. Woodward, Washington, D. C.
14 Case of Partial Atelectasis with Capillary Bronchitis and Temperature of 110 F. A. Hymanson, New York.

2. **Liver Function in Normal Pregnancy.**—In 200 cases of so-called normal pregnancy examined by Litzenberg sixty-two gave the reaction for urobilinogen or urobilin. In none of the cases was there evidence of blood dyscrasia, although some of the patients were quite anemic. There were no complications which are known to be accompanied by reduced liver function except, possibly, eleven cases of valvular heart lesions and one of infection of the urinary tract with high fever. In heart disease urobilinuria is not present unless there be decompensation. In none of these cases was there marked clinical evidence of decompensation. There were two cases with slight dilatation as well as hypertrophy in which there would be even more likelihood of heart weakness. There were fifty cases in which the interference with the functions of the liver could be accounted for only by the pregnancy itself. This still leaves 25 per cent. of disturbed liver function during pregnancy attributable to no other cause than the pregnant condition.

6. **Splenic Anemia with Splenectomy.**—The histopathologic picture presented in the case cited by Clark is that of primary diffuse hyperplasia of the spleen (chronic splenitis). While Clark only claims great improvement after splenectomy, the patient in a recent letter considers herself cured.

American Journal of Orthopedic Surgery, Boston

February, XIV, No. 2, pp. 59-118

15 Deformities Due to Infantile Paralysis; Operative Treatment. E. W. Ryerson, Chicago.
16 *Bone Grafting for Spinal Conditions: Report of Forty Cases. J. T. Rugh, Philadelphia.
17 *Fractures of Spine without Paraplegia: Study of Eleven Cases. J. B. Hartwell, Boston.
18 Overlapping Joint as Substitute for Cuneiform Osteotomy. P. Hoffmann, St. Louis.
19 Case of Deposit in Supraspinatus Muscle Simulating Subacromial Bursitis. J. Dunlop, Washington, D. C.

16. **Bone Grafting for Spinal Conditions.**—Since June, 1912, Rugh has placed forty grafts in the spine for spondylitis, and in this series the mortality has been nil, and he has lost but one graft. The patients ranged in age from 3 to 54 years. The disease had existed from six months to twenty-seven years prior to operation. The kyphos was in varying stages of prominence, from very slight to very severe. The average length of time the cases remained supine was six weeks, and the average time of wearing a support was six months. The average length of the graft was 6 inches, and there was no suppuration in any graft, though there were four or five cases of stitch infection. The results are as follows: excellent, twenty-six cases; improved, five cases; not relieved, two cases; died, five patients (1 in twenty-seven months and 1 in fifteen months of pulmonary tuberculosis; 1 in eight months from heart disease; 1 in four weeks from pyocyaneus infection from mastoid disease, and 1 in two years from an unknown cause); not heard from, 1 case; and too recent for results, 4 cases.

17. **Fractures of Spine without Paraplegia.**—Hartwell says that fractures of the vertebral bodies and lumbar transverse processes are not infrequent injuries but are generally overlooked. These fractures cause steady pain in the back but need not be accompanied by any neurologic symptoms. Localized tenderness over the spinous processes should always suggest the possibility of fracture of the spine, and if in addition to localized tenderness there is a disalinement of the spinous processes, the diagnosis is almost certain. The kyphos caused by compression fractures may readily be mistaken for the deformity of a bad posture. Treatment should consist in prolonged fixation of the spine in extension by plaster jackets or permanent splinting of the spine by a bone grafting operation.

American Journal of Public Health, Boston

January, VI, No. 1, pp. 1-96

20 Survey of Activities of Municipal Health Departments in United States. F. Schneider, Jr., New York.
21 Wasters of World. W. C. Redfield.
22 Rôle of Newspaper in Dissemination of Public Health News. W. A. Evans, Chicago.
23 Sixteen Hundred Cases of Sickness and What is to Be Done About Them. E. A. Moree, New York.
24 Comparison of Acid Production of Bacillus Coli Group Isolated from Various Sources. W. W. Browne, New York.
25 Report of Committee on Occupational Mortality. W. F. Snow and others, Sacramento, Calif.
26 New Sampling Apparatus for Determination of Aerial Dust. G. T. Palmer, New York.

American Journal of Roentgenology, New York

January, III, No. 1, pp. 1-62

27 Teaching of Roentgenology in Undergraduate Medical Schools. F. C. Zapffe, Chicago.
28 Scope and Method of Teaching Roentgenology. L. G. Cole, New York.
29 Experiences in Roentgenologic Teaching. H. K. Pancoast, Philadelphia.
30 Simple Method for Marking Roentgen Ray Plates. I. H. Levy, Syracuse.
31 Report on Three Interesting Head Lesions. A. W. George, Boston.
32 Gastro-Intestinal Lesions Based on One Hundred Cases in which Roentgenologist was Present at Operation. L. T. Le Wald, New York.

Annals of Surgery, Philadelphia

February, LXIII, No. 2, pp. 129-256

33 *Localization of Cerebellar Tumors. E. G. Grey, Boston.
34 Cases of Calculi in Submaxillary Gland and Wharton's Duct. F. S. Mathews, New York.
35 Tuberculosis of Tongue: Report of Cases. L. Durante, Rochester, Minn.
36 *Tanners' Ulcer. J. C. DaCosta, J. F. X. Jones and R. C. Rosenberger, Philadelphia.
37 Multiple Cartilaginous Exostoses (Hereditary Deforming Chondrodysplasia): Report of Cases. A. P. C. Ashhurst, Philadelphia.
38 *Treatment of Varicose Leg Ulcers. P. G. Skillern, Jr., Philadelphia.
39 Artificial Periosteum for Fixation of Shaft Fractures. J. B. Roberts, Philadelphia.
40 Homoplastic Transplantation of Boiled Segment of Radius. C. A. McWilliams, New York.
41 Symmetrical Congenital Malformation of Extremities. Report of Two Cases. S. W. Boorstein, New York.
42 *Peritoneal Adhesions; Their Prevention with Citrate Solutions. M. H. Walker, Jr., Pittsfield, Mass., and L. M. Ferguson, Boston.
43 *Id. S. Pope, San Francisco.
44 Surgery of European War. E. B. Piper, Philadelphia.
45 Fractures of Neck of Scapula. J. M. Hitzrot and R. W. Bolling, New York.

33. **Localization of Cerebellar Tumors.**—Of fifty-eight certified cases of cerebellar and extracerebellar tumor examined by Grey, an unusual attitude of the head—tilted so that the ear approximated one shoulder—was found in twenty-three. In the majority of these the change in position was slight. Of forty-three certified cases of tumor lying anterior to the cerebellum only three showed any tilt of rotation of the head. The unusual attitude in these three cases was scarcely noticeable. These findings indicate that a tilt or rotation of the head in a patient with symptoms pointing toward an intracranial tumor is suggestive of a subtentorial new growth. Backward retraction of the head was a feature in eight of the sixty cases of cerebellar and extracerebellar tumor. Typical opisthotonos attacks appeared in two of these. A similar position was noted in none of the cases with tumors lying anterior to the cerebellum. Some form of suboccipital discomfort was present in forty-four, about 75 per cent. of the cases. Tenderness in the suboccipiut was found in twenty-one, 36 per cent. Suboccipital headache or pain was complained of in thirty-three, 56 per cent. There was more or less soreness or stiffness of the neck muscles in eighteen, nearly 31 per cent. Of forty-three certified cases with tumors lying anterior to the cerebellum some degree of suboccipital discomfort was found in fourteen, approximately 33 per cent. Suboccipital tenderness was present in eight, nearly 19 per cent. Suboccipital headache or pain appeared in ten, about 23 per cent., soreness or stiffness of the neck muscles in six, 14 per cent. As a rule, occipital discomforts were much less intense in the cases with tumors situated anterior to the cerebellum than in those with subtentorial new growths.

36. **Tanners' Ulcer.**—The authors describe an ointment which Dr. Louis Levi, of Milwaukee, has been using successfully to prevent this disease. He orders that the ointment be applied twice daily. Three parts of petrolatum are mixed with one part of lanolin. This mixture is melted on a water bath or stove and when melted and thoroughly mixed, 10 to 15 drops of 90 per cent. phenol are added to every 400 gm. of the mixture. This represents 5 drops of phenol to 4 gm. of ointment. The material is placed into a glass or earthenware jar and allowed to solidify until ready for use. The workman cleanses his hands and arms thoroughly with soap and water, rinses with warm water and, while the parts are still moist, applies the ointment. He rubs it over the whole exposed area for about two or three minutes. He then takes a clean cloth and wipes the skin entirely dry. The lanolin is absorbed by the skin and the petrolatum forms a light coating on the surface. The petrolatum will keep most of the chrome which causes the trouble away, but, should this outer coating of petrolatum wear off, the lanolin in the skin will still prevent the action of the chrome.

38. **Treatment of Varicose Leg Ulcers.**—For the routine treatment of the average varicose leg ulcer Skillern uses Unna's zinc oxid and gelatin paste enmeshed in a gauze bandage so as to form a stocking with the consistency of rubber. On the patient's return the Unna stocking is fenestrated at the site of the ulcer, as indicated by the area of staining from the discharge. In addition to fenestrating the stocking, Skillern cuts the edge of the fenestration in a spoke like manner, to prevent congestion of the ulcer from the edge of the fenestration pressing into the edge of the ulcer. After

the ulcer has been uncovered by fenestration of the stocking in this manner, it is treated by the rubber tissue, dry gauze, muslin bandage method. After varicose leg ulcers have been cured, it is important immediately to institute prophylactic methods against recurrence; and for this purpose a well fitting silk elastic stocking or a Randolph bandage should be used. Patients should be reminded that in the course of time a silk elastic stocking wears out and loses its power of supporting the tissues, and that for this reason a new stocking must be purchased at intervals.

42. **Prevention of Peritoneal Adhesions.**—This report gives the results of experiments made by Walker and Ferguson with hypertonic solutions of sodium citrate and sodium chlorid, used in the hope of preventing postoperative adhesions in the abdomen. The authors state that hypertonic citrate solutions do, under certain conditions, prevent peritoneal adhesions after laparotomy. The best solution is sodium citrate 3 per cent. and sodium chlorid 1 per cent. In human surgery, the citrate solution should, theoretically, be used as it has been experimentally; namely, after clean laparotomies, a sufficient amount of solution should be introduced into the abdomen to bathe the whole peritoneum (500 to 600 c.c.). Smaller amounts would be of little value, for any fluid introduced into the abdomen soon becomes distributed over the whole cavity. Practically, the question of whether or not the citrate solution will cause surgical shock in man must be determined by actual tests in the operating room. If, as the authors anticipate, no shock is caused, the solution should be used as advised above. When it is necessary to pack off intestines with gauze, if the pack is wet with citrate solution, much fewer adhesions should result. Absolute asepsis is essential. Adhesions cannot be prevented in the presence of infection. Gentleness in handling peritoneum is important, for the more injured peritoneum left after operation, the greater is the likelihood of adhesion formation. Large areas denuded of peritoneum should be covered by plastic operations or omental grafts, for the larger the denuded areas left, the more difficult is the prevention of adhesions. Iodin should be used in abdominal surgery with great care, or better, not used at all, for a very little of it allowed to touch the bowel causes masses of adhesions. Dry gauze should not be allowed inside the abdomen.

43. **Prevention of Peritoneal Adhesions.**—Pope reports on the use of a solution of citrate of soda 2 per cent. with sodium chlorid 2 per cent. in some 400 abdominal sections. All sponges and gauze pads were moistened with this solution. In about twenty cases, a considerable quantity of the solution was left in the abdominal cavity. This amount ranged from 4 ounces to a pint. Since this procedure causes pain and partially rouses the patient it has been found expedient to have the incision almost closed before introducing the liquid. The abdominal wounds do show more oozing during closure, but in no case has it seemed to lead to failure of union or to postoperative bleeding. There is no evidence to show that the liability to infection is increased, but, on the contrary, where peritonitis was present, a marked improvement seems to have occurred. The character of cases in which a quantity of solution was left in the abdominal cavity included general postoperative adhesions, acute obstructions, pus tubes, colectomies, resections and tuberculous peritonitis.

Archives of Ophthalmology, New Rochelle, N. Y.

January, XLV, No. 1, pp. 1-108

46 Acidosis and Edema in Its Relation to Glaucoma. H. Smith, Amritsar, India.
47 Histologic Findings After Iridotasis. F. H. Verhoeff, Boston.
48 Lumbar Puncture and Examination of Spinal Fluid in Affections of Eye. J. B. Ayer, Boston.
49 Massive Granuloma of Sclera (Brawny Scleritis); Report of Unusual Case. G. S. Derby, Boston.
50 Torticollis Relieved by Tenotomy of Inferior Oblique. A. Duane, New York.
51 Local Anesthesia in Exenteration and Enucleation of Eyeball with Novocain Solution. H. Illig, Munich.
52 Examination of Visual Field in Glaucoma and Its Value for Differential Diagnosis. W. Löhlein, Greifswald.

Boston Medical and Surgical Journal

February 10, CLXXIV, No. 6, pp. 187-222

53 Sir James Paget and Paget's Disease. E. C. Cutler, Boston.
54 Organization for Care and Transportation of Sick and Wounded in British Expeditionary Forces in France. R. I. Lee, Boston.
55 Occurrence of Wassermann Reaction Among Hospital Patients. A. A. Hornor, Boston.
56 Treatment of Central Nervous System Syphilis. I. C. Walker, Boston.
57 Treatment of Syphilis. C. M. Smith, Boston.

Bulletin of Johns Hopkins Hospital, Baltimore

February, XXVII, No. 300, pp. 29-62

58 *Influence of Pituitary Feeding on Growth and Sexual Development. E. Goetsch, Baltimore.
59 Case of Pseudohermaphrodism; Abnormal Function of Endocrine Glands. W. C. Quinby, Baltimore.

58. **Influence of Pituitary Feeding on Growth and Sexual Development.**—A very intensive study was made by Goetsch. He found that the dried powdered pituitary extract derived from both the anterior and posterior lobes of the gland, when fed to young rats in excessive doses (0.1 gm. daily), causes failure to gain in weight, loss of appetite, increased peristalsis, a mild enteritis, and certain nervous manifestations, such as muscular tremors and weakness of the hind limbs. The latter symptoms are undoubtedly due to the posterior lobe element in the whole gland extract, for they are similarly produced by using posterior lobe, but not by using anterior lobe extract. Even when whole gland is fed over a short period of time, from twenty-five to forty days, it causes a more rapid growth and development and gain in weight, larger nipples in the female, and a coarser, drier, harsher growth of hair than are seen in either control animals or after similar administration of ovarian (corpus luteum) extract in equivalent dosage. In comparison with the development in control animals, the ovaries, tubes and cornua of the uterus of animals fed with whole gland extract are larger, more vascular and edematous in appearance, indicating increased development and activity. The testes show a considerably earlier growth and development. The feeding of pituitary anterior lobe extract causes increased weight and greater and more vigorous body growth and development over the control. There is similarly an earlier and more active genital development. The fur is harsher and thicker. Loss of weight, enteritis, and nervous manifestations are not observed as in the beginning of whole gland feeding. After prolonged feeding of anterior lobe extract, over a period of eight or nine months, the sexual instincts are early awakened, along with the early maturity of the sex glands.

The feeding of pituitary anterior lobe to parent rats exerts its stimulating influence on the offspring in intra-uterine life and during lactation, and, when the experiment is carried further, and the feeding to the young is continued after weaning, it has an even greater stimulating effect on growth, weight and development, and causes earlier and more frequent breeding, and an increased number of offspring in the litters. The stimulating effect on the sex glands is greater, the longer the influence of anterior lobe administration is exerted. The extract of pituitary posterior lobe, even after prolonged administration, does not stimulate growth in general, nor the development of the sex glands, as does anterior lobe even after a very short period. The posterior lobe element in the whole gland extract has an undoubted retarding influence on the development of the sex glands, an effect very similar to that of ovarian extract on the testes. Ovarian extract (corpus luteum), when fed to the male, especially, causes a tendency toward the deposition of fat, not only in the body generally, but in the testes and other glands as well, with a resultant marked increase in weight. The fur is heavier and coarser than in the animal fed with the posterior lobe extract. It does not cause an early descent of the testes. The latter are slightly heavier than those of the posterior lobe fed animal. Following ovarian feeding there is, as compared with conditions in the control, increased development and activity of the female sex glands.

Bulletin of Medical and Chirurgical Faculty of Maryland, Baltimore

February, VIII, No. 8, pp. 129-152

60 Diagnosis of Malignancy in Mammary Gland. A. C. Harrison, Baltimore.

Canadian Medical Association Journal, Toronto

January, VI, No. 1, pp. 1-96

61 Origin of Naso-Antral Polyp. D. J. G. Wishart, Toronto.
62 Dermatology and General Practitioner. W. S. Walsh, Providence, R. I.
63 Treatment of Squint. J. A. MacMillan.
64 Static Joint Disease. J. A. Nutter, Montreal.
65 Cortical Localization. G. Jefferson, Victoria, B. C.
66 Stab Wound of Liver. F. J. Tees, Montreal.

Delaware State Medical Journal, Wilmington

November, 1915, VI, No. 12, pp. 1-22

67 Difficult Diagnosis in Typhoid. B. A. Jenkin, Wilmington.

Journal of Cancer Research, Baltimore

January, I, No. 1, pp. 1-123

68 *Origin of Tumors in Mice. Part Played by Internal Secretion in Spontaneous Development of Tumors. A. E. C. Lathrop and L. Loeb, St. Louis.
69 Mortality from Cancer in Western Hemisphere. F. L. Hoffman, Newark, N. J.
70 *Effect of Phloridzin on Tumors in Animals. F. C. Wood and E. H. McLean, New York.
71 *Pathologic Aspects of Some Problems of Experimental Cancer Research. J. Ewing, New York.
72 Transplantable Sarcomas of Rat Liver Arising in Walls of Parasitic Cysts. G. L. Rohdenburg and F. D. Bullock, New York.
73 Chemotherapeutic Experiments on Rat Tumors. R. Weil, New York.

68. **Origin of Tumors in Mice.**—Lathrop and Loeb have found that castration of female mice below the age of 6 months leads to a very marked decrease in the cancer incidence of these animals, although they have not so far succeeded in preventing cancer altogether under these conditions. The cancer age is increased in castrated female mice. Castration in mice above the age of 6 months has so far been without effect. The prevention of breeding in female mice decreases the cancer incidence and increases the cancer age, though to a much smaller degree than does castration. Nonbreeding female mice reach a higher age than breeders. These results are interpreted by the authors as due to the influence of the corpus luteum on the growth of the mammary gland, and as the first experimental demonstration of internal secretion as an etiologic factor in the spontaneous development of cancer. The chemical action is superimposed on a hereditary factor distinct from the former.

70. **Effect of Phloridzin on Tumors.**—In the experiments cited by Wood and McLean the animals were injected with phloridzin in suspension in olive oil. Treatment was begun, as a rule, seventeen days after inoculation. All treated animals were kept rigidly on a diet of meat and lard, while the control animals were given the regular laboratory diet of dry bread and vegetables. From time to time, at the end of the second or third day period following injections of the phloridzin, the collected urines were examined for sugar with Fehling's solution and were found to give a positive reaction in the case of the treated animals on the carbohydrate-free diet, while the urine of the untreated animals as well as a phloridzin solution gave a negative reaction. The animals under treatment rapidly became emaciated, the fur roughened, and they appeared to be very ill; a great many died soon after the beginning of the treatment. For the experiments with the Buffalo rat sarcoma, 324 animals were inoculated, with 90.4 per cent. of "takes." For the experiments with mouse sarcoma No. 180, 396 mice were inoculated, with 97.7 per cent. positive. Among the mice bearing spontaneous tumors and Crocker Fund mouse sarcoma No. 180, there were no cases of absorption of the tumors under treatment. The Buffalo rat sarcoma showed a much smaller percentage of absorption among the treated animals than among the controls, 37 per cent. as compared with 58.4 per cent. In the majority of the experiments the growth among the treated animals was much more vigorous than that among the controls. Considering the very great variability of growth of the Buffalo rat sarcoma, as well as the high percentage of cases of spontaneous absorption occurring constantly, but with a great irregularity in different series of animals, the futility of using this tumor for therapeutic experiments or of basing conclusions on such investigations, is at once evident. Any "cures" obtained in work with the Buffalo rat sarcoma must be ascribed to spontaneous absorption rather than to the effect of the therapeutic agent.

71. **Problems of Experimental Cancer Research.**—Ewing is of the opinion that we must regard all forms of neoplasms as being specific diseases, connected only by the fact that they are neoplastic in greater or less degree, but differing in their etiology, clinical course, and therapeutic possibilities. In the same way, tuberculosis and bubonic plague are infectious diseases of inflammatory nature, but they are quite as closely related as Fibiger's gastric carcinoma of rats and pipe smokers' cancer of the lip. The habit of regarding cancer as a protean disease of uniform significance may well be abandoned in the interests of progress.

Kentucky Medical Journal, Bowling Green

February, XIV, No. 2, pp. 57-104

74 *Digitalis; Its Indications and Use. W. W. Anderson, Newport.
75 Intensive Treatment of Syphilis. I. N. Bloom, Louisville.
76 Heart Complications in Acute Infectious Diseases. A. L. Thompson, Madisonville.
77 Conditions Resulting from Cardiovascular Disturbances with or without Organic Changes of Heart and Vessels. W. F. Boggess, Louisville.
78 Syphilis of Heart. J. R. Morrison, Louisville.
79 Puerperal Eclampsia. H. T. Crouch, Bardwell.
80 Pneumonia. J. Glahn, Owensboro.
81 Usefulness of Roentgen Ray and High Frequency in Treatment of Skin Lesions. V. Blythe, Paducah.
82 Colles' Fracture. L. L. Robertson, Middlesboro.

74. Abstracted in THE JOURNAL, Oct. 23, 1915, p. 1484.

Laryngoscope, St. Louis

January, XXVI, No. 1, pp. 1-80

83 Recent Progress in Otology. G. L. Richards, Fall River, Mass.
84 Roentgen Ray Diagnosis of Mastoiditis. E. Amberg, Detroit.
85 Larynx in One Hundred Fatal Cases of Pulmonary Tuberculosis. G. Fetterolf, Philadelphia.
86 Lupus of Larynx. G. W. Stimson, Pittsburgh.
87 Upper Respiratory Passages in Habitual Users of Cocain and Heroin. R. F. Ridpath, Philadelphia.
88 Evolution of Specialist in Otolaryngology. D. J. G. Wishart, Toronto, Canada.

Medical Record, New York

February 5, LXXXIX, No. 6, pp. 223-264

89 Value of Transfusion in Atrophic and Devitalized Infants and Children. L. Fischer, New York.
90 Influenza and Grippe in Infants and Children. C. G. Leo-Wolf, Buffalo.
91 Enteroptosis. F. Robbins, New York.
92 Therapeutic Action of Carbonic Acid Brine Baths (Nauheim Baths) in Cardiovascular Diseases. J. H. Honan, Augusta, Ga.
93 Vitality of Cholera Vibrio in Water of New York Bay. A. J. Gelarie, Rosebank.
94 Treatment of Gonorrheal Ophthalmia. C. Barnert, New York.
95 Two Unusual Strains of Diphtheroid Bacilli. R. R. Mellon, Ann Arbor, Mich.

Military Surgeon, Washington, D. C.

February, XXXVIII, No. 2, pp. 123-243

96 Preparedness of Medical Department for War. H. C. Fisher, U. S. Army.
97 Secondary Hemorrhage in Military Surgery. W. H. Morriss.
98 Greater Field of Activity for Fleet Surgeon. D. N. Carpenter, U. S. Navy.
99 Postgraduate Instruction at Army Medical School. W. H. Arthur, Washington, D. C.
100 Army Motor Ambulance. K. Nelson, U. S. Army.
101 Leprosy as Major Pestilence. G. W. McCoy, Hawaii.
102 Wheel Litter Travois. W. W. Reno, U. S. Army.
103 Management of Trench Latrines in Semipermanent Camps. W. C. Montgomery, New York.

New York Medical Journal

February 5, CIII, No. 6, pp. 241-288

104 Acute Appendicitis. J. B. Deaver, Philadelphia.
105 Prompt Cure of Gonorrhea. G. A. Wyeth, New York.
106 Criminology from Standpoint of Psychiatrist. M. J. Karpas, New York.

107 Pollutions in Male. M. Hühner, New York.
108 Bronchiectasis from Standpoint of Bronchoscopist. S. Yankauer, New York.
109 Case of Eclampsia. A. Comstock, New York.
110 Meningeal Hemorrhage in New-Born: Report of Case. M. J. Lippman, New York.

New Orleans Medical and Surgical Journal

February, LXVIII, No. 8, pp. 501-566

111 Allen Treatment of Diabetes. J. T. Halsey, New Orleans.
112 Little Points of Importance in Abdominal Work. E. L. King, New Orleans.
113 Evidence to Account for Increase of Appendicitis. P. B. Salatich, New Orleans.
114 Problems in Psychiatry. M. J. De Mahy, New Orleans.
115 Case of Hematuria Relieved by Intravenous Injections of Emetin Hydrochlorid. J. F. Points, New Orleans.
116 Case of Retroperitoneal Appendix. Case of Volkmann's Ischemia. I. Cohn, New Orleans.

Oklahoma State Medical Association Journal, Muskogee

February, IX, No. 2, pp. 27-52

117 Splanchnoptosia. T. J. Martin, Oklahoma City.
118 Conservation of Health. J. W. Duke, Guthrie.
119 Preventive Medicine as Relates to Child. W. G. Little, Okmulgee.
120 Common Natural Therapy Applied in Conservation and Improvement of Infancy and Childhood. N. E. Lawson, Oklahoma City.

Ophthalmic Record, Chicago

February, XXV, No. 2, pp. 55-108

121 Tuberculosis of Eye; Treatment. W. E. Gamble, Chicago.
122 Case of Unilateral Optic Atrophy, Sole Symptom of Pituitary Growth. F. Krauss, Philadelphia.
123 Detachment of Retina Improved if Not Cured. C. Loeb, St. Louis.
124 Simple Tonometer for Clinical Use. W. N. Souter, Boston.
125 Corneoscleral Subconjunctival Seton in Glaucoma Simplex. K. K. Wheelock, Fort Wayne, Ind.
126 Subconjunctival Rupture of Eyeball. E. Blake, New Haven, Conn.
127 Cilia in Anterior Chamber. C. P. Small, Chicago.

Southern Medical Journal, Birmingham, Ala.

February, IX, No. 2, pp. 99-192

128 Glucosurias. J. S. McLester, Birmingham.
129 Clinical Diagnosis of Acute Leukemic States. L. F. Barker, W. A. Baetjer and S. R. Miller, Baltimore.
130 Physics of Bronchopneumonia. P. F. Barbour, Louisville, Ky.
131 Differential Diagnosis of Skin Manifestations in Pellagra from Other Dermatoses. C. Swanson, Atlanta, Ga.
132 Pellagra; Etiology and Treatment. W. E. Deeks, New York.
133 *Forty-six Consecutive Cases of Pellagra Treated with Cacodylate of Sodium. B. H. Booth, Drew, Miss.
134 *Small Town; Neglected Unit in Sanitary Administration. A. W. Freeman, Washington, D. C.
135 Effect that Sanitary Work Accomplished in Cuba and in Panama Has Had and Will Have on Sanitation of Tropics. W. C. Gorgas, Washington, D. C.
136 *Sex Question in Public Health. I. Dyer, New Orleans.
137 *Concentration Method for Diagnosis of Malaria. W. Krauss and J. S. Fleming, Memphis, Tenn.
138 Renaissance of Urology. H. H. Young, Baltimore.
139 Sterile Woman. F. W. Griffith, Asheville, N. C.
140 Intracranial Hemorrhage Due to Traumatic Rupture of Arteria Meningea Media: Report of Six Cases. L. H. Landry, New Orleans.
141 Skin Grafting. J. L. Crook, Jackson, Tenn.
142 Ocular Manifestation of Fifth Nerve Irritations. E. H. Cary, Dallas, Tex.
143 Method and Value of Blood Clot in Mastoid Operation. F. D. Boyd, Fort Worth, Tex.

133. **Pellagra Treated with Cacodylate of Sodium.**—Booth treated sixteen patients in 1914 and thirty in 1915, with cacodylate of sodium, with only one death. He gave adults an injection deep into the muscular tissues, about 7 grains once a week, children in proportion. He thinks that if diet alone is the cause of the disease these patients would not have recovered so easily and, further, that the disease is caused by a mildly infectious organism.

134 and 136. Abstracted in THE JOURNAL, Dec. 11, 1915, pp. 2117 and 2118.

137. **Concentration Method for Diagnosis of Malaria.**—Krauss and Fleming divide the technic into two steps: 1, that of obtaining the blood; 2, that of making the smear. For obtaining the blood, sterile cork stoppered bottles are provided, containing 10 to 20 c.c. of a solution made by dissolving 2 gm. chemically pure sodium citrate and 0.85 gm. chemically pure sodium chlorid in 100 c.c. freshly distilled water. The bottles should be sterilized once with their contents. To remove blood for diagnosis, a sterile 2 c.c. all glass syringe is first charged with 0.5 c.c. solution, filled from a vein, and the contents immediately injected into the bottle. The mixture should not contain more than 20 per cent. of blood. It is then lightly shaken and replaced in the bag. Technic for making smears: Add the amount of formaldehyd solution indicated in the chart. Usually about 0.5 c.c. of a 1:10 dilution of official 37 per cent. formaldehyd to the smaller bottles will give good hemolysis and good fixation. Small rings are well fixed in one hour. Large tertians and gametes stain best after four hours of contact with formaldehyd. They can be recognized, however, after fixation for one hour. Quicker fixation may prevent hemolysis, and can not be recommended. After fixation, using the system suitable to the time available, the contents of the bottle are put into a centrifuge tube and spun fifteen minutes at 2,500, or ten minutes at 3,000 revolutions per minute. Most of the leukocytes form a cream on the surface of the deposited blood, and can be pipetted off with the supernatant fluid, preferably with a vacuum pump. The tube is then filled with distilled water, shaken until hemolysis is complete, centrifuged again, the fluid poured off and slightly drained, and the remainder drained on a slide, dried, fixed and stained in the usual way. Beautiful pictures are obtained in fifteen minutes.

FOREIGN

Titles marked with an asterisk (*) are abstracted below. Single case reports and trials of new drugs are usually omitted.

British Medical Journal, London

January 22, I, No. 2873, pp. 117-152

1 *Soldier's Heart. J. Mackenzie.
2 Irritable Heart of Soldiers. R. McN. Wilson.
3 *Certain of Vascular Phenomena of Heart Disease. B. Parsons-Smith.
4 *Heart's Action in Jaundice. J. D. Windle.
5 From Visible to Gamma Ray Spectrum. S. Russ.
6 *Sodium Hypochlorite in Treatment of Septic Wounds. F. J. A. Dalton.

1. **Soldier's Heart.**—At least 90 per cent. of the cases that have been certified and treated as heart affections, Mackenzie says, are not primarily heart cases, and the principles of treatment applicable to the patients are widely different from those who suffer from heart failure. The chief complaint is an absence of the feeling of being well; they often feel out of sorts. A sense of fatigue or exhaustion easily induced is common to all. Breathlessness on moderate exertion is frequent, and more infrequent is pain over the region of the heart. The physical signs are variable. The heart's rate is often not increased; in some it is persistently increased, as frequent as 120 per minute. More frequently, at rest the rate may be quite moderate, but exertion, sometimes slight, may produce an undue rapidity, and it is in consequence of this excitability that the term "irritable heart" has been used. Murmurs, systolic in time and heard in different regions, are frequent, while an increase in size, usually slight, is not uncommon. In a few cases there is a slight edema of the legs. The mental condition is somewhat varied. Periods of depression are not infrequent, and the patients are often very irritable. They accept the view that they have something wrong with their hearts and readily yield to all restrictions, and are often content to lie in bed and brood over their woes. The principles of treatment should be devoted to increasing the health of the body as a whole in such a way as to increase the natural resistance to infection, to eliminate toxic influences, and brace up the whole man bodily and mentally. The best way to achieve this is by fresh air and judicious exercise in the fresh air.

3. **Vascular Phenomena of Heart Disease.**—Parsons-Smith urges that every heart case must undergo a minute examination of the heart itself, its size, rhythm, sounds, etc.: we must undertake a rather more generalized study of each particular patient; inquire into the condition of the kidneys and

their excretive powers; form some opinion as to the condition of the arterial walls, estimate the blood pressure and pulse tension; glean additional information from graphic tracings taken from the large superficial vessels, from electrocardiographic records, and by the method of direct vessel auscultation, particularly of the great venous and arterial channels at the root of the neck; and must detail a selection of the causes which warrant their very careful study.

4. **Heart's Action in Jaundice.**—Windle investigated the heart's action in a number of jaundiced patients; in some he found the pulse infrequent, in some irregular, in others both infrequent and irregular, but he has not been satisfied in any case that the jaundice was responsible for the infrequency or the irregularity. Slowing of the ventricle to 40 or below, whether occasioned by disease or poison, is, with rare exception, due to partial or complete heart block. A pulse rate about 50 to 55 a minute is not uncommon in patients with jaundice when free from fever and the patient is kept in bed, but this is not proof that the jaundice is the cause of the slow pulse; the patient's normal pulse rate must be known, and how it behaves in other conditions, because the pulse has a tendency to become infrequent in many nonfebrile illnesses when patients are confined to bed. The slowest pulse rate Windle met with due to total bradycardia, in an adult with jaundice, was 50 a minute. In a number of cases he has found a pulse rate of 40 and below; but the heart rate has been double the pulse rate, the infrequent pulse being due to an alternate premature beat of the ventricle too feeble to send a wave to the wrist.

6. **Sodium Hypochlorite in Treatment of Septic Wounds.**—The advantages observed in the employment of the sodium hypochlorite solution in the treatment of septic wounds are briefly stated by Dalton as follows: (1) the simplicity and cheapness of preparation of the antiseptic; (2) being nontoxic and nonirritating to the tissues when properly prepared according to Dakin's formula, the hypochlorite solution may be safely used in large quantities over long periods of time without ill effects; (3) the deodorant action of the solution is remarkable. The fetor from gangrenous tissues usually disappears in twenty-four hours; (4) the rapidity with which sloughs separate and clean granulation tissue is formed in a wound under its influence; (5) the infrequency of redressing required for wounds treated as described with hypochlorite, compared with the constant change of dressings required in large wounds with other forms of antiseptic; (6) the fact that the injections of the hypochlorite solution into the rubber tubes used in the dressings may with safety be entrusted to imperfectly trained orderlies without fear of ill results, once the case has been adequately dealt with by the surgeon.

Dublin Journal of Medical Science

January, III, No. 529, pp. 1-70

7 Meningitis Serosa. T. G. Moorhead.
8 Infantile Tetany. S. Sheill.

Journal of Laryngology, Rhinology and Otology, London

January, XXXI, No. 1, pp. 1-32

9 Throat, Nose and Ear Diseases and Their Treatment in John Hunter's Time. W. H. Kelson.
10 When Shall We Operate in Chronic Maxillary Sinusitis and What Form of Operation Shall We Choose? R. H. Skillern.
11 Primary Tuberculosis of Pharynx and Larynx in Male Sixty-Nine Years of Age. J. B. Horgan.
12 Columnar Carcinoma of Ethmoid; Operation and Cure. J. B. Horgan.
13 Bullet Wound on Nose. W. F. Wilson.

Journal of Tropical Medicine and Hygiene, London

January 15, XIX, No. 2, pp. 17-28

14 *Pellagra. W. M. McDonald.
15 Occurrence of Bodies Resembling "Seidelin Bodies" (Paraplasma Flavigenum?) in Anemic and Fetal Blood. J. W. Cropper and A. H. Drew.

14. **Pellagra.**—McDonald is of the opinion that no investigation into the etiology of pellagra can be complete which does not include within its scope the determination of the absent element in the dietary of pellagrins. On the assumption that all fatty articles of diet, such as butter, cream, etc., are more or less expensive and therefore not obtainable by the poorer classes, he suggests that it is possible that a deficiency of fat in the diet may prove to be a factor in its causation. The fact of the great prevalence of pellagra in state institutions in all parts of the world as compared with its total absence among attendants and employees in such institutions, is rather in favor of this theory, for the inmates are entirely restricted to institution dietaries, which dietaries are, as a rule, very deficient in fatty elements, whereas the attendants, even in cases in which rations are provided, are at liberty to supplement their diet at will. But whether the deficiency be of fat or of some other element of diet, McDonald believes that pellagra only occurs among those persons who by reason of poverty or confinement in an institution, or eccentricity of taste, or constitution, such as dyspepsia, are debarred from exercising a natural selection in regard to articles of diet. The author has not found any treatment which could be considered successful. Arsenic does not seem to have much effect on the course of the disease. Diarrhea is treated with usual remedies. In mild cases rest and increased dietary appears to benefit the patient.

Lancet, London

January 22, I, No. 4821, pp. 173-226

16 Clinical Thermometry; Continuous and Quasi-Continuous Temperature Records in Man and Animals in Health and Disease. (To be continued.) G. S. Woodhead and P. C. Varrier-Jones.
17 *Bactericidal Power Acquired by Serum After Administration of Salvarsan or Neosalvarsan. S. R. Douglas and L. Colebrook.
18 Biology of Vermiform Appendix. W. C. MacKenzie.
19 *Friedländer's Pneumobacterium. A. R. Friel.
20 Case of General Tetanus Following Local Tetanic Spasms of Injured Limb. T. B. Mouat.
21 Gastrotomy in Baby Aged Six Months. C. P. G. Wakeley.
22 Stretchers for Wounded in Trenches. G. H. Colt.

17. **Bactericidal Power of Serum.**—Neosalvarsan and salvarsan in watery solutions possess, according to Douglas and Colebrook, a very distinct bactericidal power against staphylococcus when the strength of the solution is 1 in 6,000. When the solvent largely consists of blood or serum this power is slightly diminished. The bactericidal power of solutions of both these preparations appears to be practically the same. The administration of neosalvarsan in ordinary doses renders the blood fluids markedly bactericidal. This power lasts but a short time, and seems to reach its maximum about one hour after the administration of the drug, diminishing rapidly in the third and fourth hours. Heating the serum to 60 C. for from ten to twenty minutes has no deleterious effect on this bactericidal power, showing that it is not in any way due to the development of immune bodies in the serum; and this fact, together with the short period in which the serum is found to be bactericidal, strongly suggests that the bactericidal power is due to some arsenic compound in solution in the blood serum. Salvarsan which, as mentioned above, has almost identically the same bactericidal power as neosalvarsan in in vitro experiments, gave practically no demonstrable bactericidal power to the patient's serum when ordinary therapeutic doses were administered, but it was constantly noticed that organisms which had been treated with serum obtained within three hours of the administration of the drug grew very much more slowly than normally and were agglutinated into masses. In view of the distinct bactericidal power which the serum acquires after the administration of neosalvarsan, the authors believe it is reasonable to hope that the administration of this drug, or some similar preparation, would have a beneficial effect on wound or other similar septicemias, and might even strikingly assist in the sterilization of deep and irregular suppurating wounds.

19. **Friedländer's Pneumobacterium.**—In treating patients suffering from ozena Friel finds that to get rid of the Friedländer infection it is advantageous to give the vaccine intravenously. He uses as a dose two millions of a sensitized nonsterilized emulsion in salt or distilled water, which is injected into a vein at the bend of the elbow or in the forearm.

Bulletin de l'Académie de Médecine, Paris

January 4, LXXV, No. 1, pp. 1-20

23 *Spiroscopy Training to Increase the Breathing Capacity. (Entrainement respiratoire par la méthode spiroscopique.) A. Robin.

24 *Intensification of Natural Decomposition after Death. (Désintégration par protéolyse microbienne.) F. Bordas and S. Bruère.

23. **Training the Respiratory Apparatus.**—Robin expatiates on the advantages of Pescher's spiroscopy, described in these columns January 29, p. 386. He styles it "an innovation in medicine most fertile in results in practical application. The lungs are exercised by their own efforts and in the simplest and most physiologic way, while the play of the bubbles in the water keeps up the interest and stimulates to renewed efforts." The method is in constant use now in a number of French hospitals, and is proving most valuable in overcoming the effects of wounds of the chest and of disease. It is especially valuable for prophylaxis in children. The little ones enjoy it as a game, and the narrow-chested may double their breathing capacity with it in a few weeks. Robin saw a demonstrative case recently. The auscultation findings had become suspicious in a 10 year old girl, both of whose parents had died young of tuberculosis. Under spiroscope exercises the condition became completely transformed in a few months.

24. **Means to Hasten Decomposition After Burial.**—Bordas and Bruère have been experimenting on an extensive scale and here announce that it is possible to hasten materially the disintegration of corpses by supplementing the action of the ferments of putrefaction within the cadaver by the action of similar ferments applied from without. The ferments of urea were found most efficient for the purpose, especially with moisture and warmth. The practical method proposed is to line the grave or ditch with straw to keep in the heat from the microbian fermentation processes; the straw to be well watered with cultures of the ferments of urea. A horse was buried in new moist wheat straw watered every second day for six days with 30 liters of a bouillon culture of urea ferments. (They give no details as to the preparation of this putrefaction-promoting fluid.) By the end of three weeks the skeleton was bare; all the flesh was gone except a few scraps of fascia tissue, the joints had come apart and even the skin had disappeared, nothing but the tail being left intact, separate from the skeleton. Admission of a little air promotes the disintegration. Not only during the war but in cemeteries everywhere great hygienic progress would be realized, they reiterate, by thus intensifying the normal work of Nature.

Journal de Chirurgie, Paris

September, 1915, XIII, No. 4, pp. 329-440

25 Resection of Elbow for Ankylosis Consecutive to Gunshot or Shell Wound. (De la résection du coude dans les ankyloses par blessures de guerre.) A. Mouchet and R. Gouverneur.

26 Primary Resection of Wounded Elbow: Indications, Technic and After-Treatment. (De la résection dans les plaies articulaires du coude par projectiles de guerre.) R. Leriche.

Paris Médical

January 15, VI, No. 3, pp. 57-96

27 The War and Tuberculosis. (La guerre et la tuberculose 1914-1915.) L. Landouzy.

28 Prophylaxis of Tuberculosis during the War. (La défense sociale contre la tuberculose pendant la guerre.) L. Rénon.

29 Typhoid in the Tuberculous and Tuberculosis Following Typhoid. (Fièvre typhoide et tuberculose.) L. Bernard.

30 Sanatoriums for Tuberculous Soldiers. (De l'hospitalisation temporaire et économique des tuberculeux de guerre.) F. Dumarest and A. Vigne; (L'assistance et l'éducation des tuberculeux de la guerre dans les stations sanitaires du ministère de l'intérieur.) H. Labbé.

31 Roentgen Diagnosis of Tuberculosis. (Utilité de la radioscopie pour la sélection rapide des tuberculeux aux armées.) H. Grenet.

32 Tracheobronchial Glandular Lesions Mistaken for Projectiles and vice versa. (Adénopathies trachéo-bronchiques et projectiles de guerre.) A. Weil.

Presse Médicale, Paris

January 13, XXIV, No. 2, pp. 9-16

33 Dorsal Friction Sounds in Nephritic Pericarditis with Much Effusion. (Le frottement péricardique dorsal dans les péricardites brightiques à grand épanchement.) Chauffard.

34 Measures to Arrest the Spread of Venereal Disease. (La prophylaxie antivénérienne par les administrations civiles et militaires.) F. Balzer.

Berliner klinische Wochenschrift

January 3, LIII, No. 1, pp. 1-28

35 Importance of Immobilizing Dressings in Treatment of Wounds of Bones and Joints. (Wichtigkeit feststellender Verbände bei der Behandlung von Knochen- und Gelenkschusswunden.) W. Körte.

36 Experiences of an Ophthalmologist with the Troops on Active Service. (Kriegs-ophthalmologische Erfahrungen und Betrachtungen.) W. Uhthoff.

37 *Spirochaeta Pallida in the Cerebrospinal Fluid. (Ueber die Infektiosität des Liquor cerebrospinalis bei Syphilis.) R. Frühwald and A. Zaloziecki.

38 Wounds of Neck and Urethra. (Kasuistische Mitteilungen zur Kriegschirurgie.) M. Litthauer.

37. **Demonstration of Spirochaeta Pallida in the Cerebrospinal Fluid.**—Frühwald and Zaloziecki review what has been written on this subject and report the results of their own research. They tested the cerebrospinal fluid by injecting it into the testicles of rabbits. The results they obtained added to those previously on record show positive findings in primary and secondary syphilis, without nervous manifestations, in a total of 2 cases (none before the eighth week); in secondary syphilis, from the third to the twelfth month, in 7 cases; never in tertiary syphilis. In the cases with objective nervous symptoms: in early syphilitic meningitis, once; neurorecurrence (eight months), once; apoplexy and hemiplegia (seven months), once; (one year), once; syphilitic meningitis, once; spinal syphilis (ten years), once; tabes, 2 cases, and progressive paralysis, 5 cases. In inherited syphilis, soon after birth, 2 cases; syphilitic leptomeningitis later in life, once, and juvenile paralysis, once. This compilation includes Frühwald and Zaloziecki's 23 syphilitic patients tested in this way. Spirochetes were found in only 4 of the total 23; once in recent secondary syphilis, once in older secondary syphilis (without nervous symptoms), once in early meningitis, and once in progressive paralysis. They add that large numbers of others with tabes, paralysis and brain syphilis were also tested, with constantly negative results. The inoculation lesion in the rabbit testicle was so slight that only the microscope disclosed its positive nature. The data presented show that the cerebrospinal fluid is only rarely infectious. The fluid otherwise may or may not be normal, and there may or may not be a positive seroreaction and symptoms on the part of the nervous system. There is thus no regularity in the findings.

Correspondenz-Blatt für Schweizer Aerzte, Basel

January 1, XLVI, No. 1, pp. 1-32

39 The Progress of Surgery. (Fortschritte der Chirurgie.) H. Iselin.

40 *Pellagra in Switzerland. (Ueber den pellagrösen Symptomenkomplex bei Alkoholikern in der Schweiz.) J. Jadassohn. Commenced in No. 52.

40. **Pellagra in Switzerland.**—The main points in this article were reviewed in these columns February 12, p. 539.

Deutsche medizinische Wochenschrift, Berlin

January 6, XLII, No. 1, pp. 1-32

41 *The Spirochete Nodosa as Cause of Infectious Jaundice. (Zur Aetiologie der Weilschen Krankheit. II.) E. Hübener and M. Reiter.

42 Agonal Thrombosis. H. Ribbert.

43 Work in Treatment of Nervous Affections in Soldiers. (Weitere Erfahrungen mit der Heilbeschäftigung nervenkranker Soldaten.) R. Wollenberg.

44 *Mixed Infection with Epidemic Meningitis. H. Silbergleit and K. v. Angerer.

45 Canned Culture Mediums. (Erfahrungen mit dem Büchsenagar von Uhlenhuth und Messerschmidt in China.) H. Dold.

46 Simplified Technic for Bacteriologic Research. (Anstellung der Agglutinations-Reaktion nach Widal und Gruber-Durham.) K. Brauer; (Färbung von Tuberkelbazillenpräparaten.) K. Brauer.

47 Burns from "Light Balls"; Four Cases. (Verbrennung durch Leuchtkugel.) Goebel.

48 Preparation for the Prothesis after Amputation. (Vorbereitende Behandlung der Beinamputierten.) J. Lewy.

49 *The Urochromogen and Diazo Reactions. (Permanganreaktion und Diazoreaktion.) S. E. C. Bosch.

50 Compulsory Hospital Treatment as Penalty for Exposing Others to Venereal Disease. (Wie soll der Geschlechtsverkehr Venerischer bestraft werden?) A. Blaschko; (Die Bestrafung des Geschlechtsverkehrs Venerischer.) F. Ebermayer.

51 Old Women's Psychology. (Altweiber-Psychologie.) v. Luschan.

41. **Etiology of Infectious Jaundice.**—Hübener and Reiter say that Uhlenhuth's report of the results of his research has confirmed their previous statements in regard to the causal importance of the spirochete which they isolated from patients with Weil's disease. (Mentioned in THE JOURNAL February 19, p. 610.)

44. **Mixed Infection in Meningitis.**—Silbergleit and von Angerer report six cases connected by time and locality, and one with no such connection, in all of which the symptoms indicated epidemic meningitis with sepsis and an extensive petechial exanthem. All cases terminated fatally notwithstanding serotherapy was applied at once. In the four cases examined for the purpose, mixed infection was apparent.

49. **Comparison of Urochromogen and Diazo Findings.**—Bosch relates that in examining about 1,000 specimens of urine the diazo reaction never occurred without the urochromogen reaction, and the latter was encountered twice as often as the former in advanced cases of tuberculosis. About 96 per cent. of the patients with the urochromogen reaction and 100 per cent. of those with the diazo died in less than eight months thereafter. She gives the precision technic for both.

Medizinische Klinik, Berlin

Dec. 26, 1915, XI, No. 52, pp. 1417-1432

52 Gunshot and Shell Wounds of the Fingers. (Zur Behandlung der Fingerschüsse.) H. Schloffer.
53 *Hypnosis in Treatment of War Hysteria. (Zur therapeutischen Verwendung der Hypnose bei Fällen von Kriegshysterie.) M. Nonne. Commenced in No. 48.
54 Technic of and Experiences with Vaccination against Cholera and Typhoid. (Die Erzeugung der Impfstoffe und Massenimpfungen in Krakau gegen Cholera und Typhus in der Zeit des Krieges 1914-15.) O. Bujwid.
55 Aphonia and Mutism from Fright Neurosis. (Funktionelle Sprachlähmung im Felde.) W. Scholz.
56 *Fulminating Meningitis with Atypical Symptoms. (Ein unter eigentümlichen Symptomen auftretender Fall von Meningitis cerebrospinalis epidemica fulminans.) N. Rosenbaum.
57 Simplified Technic for Counting Bacilli in Sputum. C. Martin.

January 2, XII, No. 1, pp. 1-30

58 Tardy Disturbances after Injury of the Skull. (Ueber Spätererkrankungen nach Schädelverletzungen.) A. Passow.
59 *Experiences with Tests of Kidney Functioning. (Funktionelle Nierendiagnostik.) C. von Noorden.
60 Affections of the Urinary Organs from Chilling. (Kriegserfahrungen über Erkältungskrankheiten der Harnorgane.) V. Blum.
61 Operative Treatment of Traumatic Rupture of Right Rectus Muscle. O. Orth.
62 *Vaccine Therapy of Typhoid after Prophylactic Inoculation. (Zur Vaccinetherapie des Typhus abdominalis bei den prophylaktisch Geimpften.) K. Mayer.
63 Technic for Amputation of Leg. (Zur Methode der Unterschenkelamputation.) Neuschäfer.

53. **Hypnosis in Treatment of War Hysteria.**—This article was summarized in the Berlin Letter in THE JOURNAL, February 5, p. 440.

56. **Meningitis Simulating Diabetic Coma.**—Rosenbaum reports the case of a woman factory worker of 32 who complained one day of headache and became unconscious, with great motor restlessness, tossing her arms around and even tumbling out of bed, the eyeballs constantly turning to and fro, and with incontinence of urine but no fever, edema or eruption. The urine findings were approximately normal except for a positive response to Trommer's test and the ferric chlorid test. This led to the assumption of diabetic coma until the next day showed the responses much fainter, and at 7 p. m. symptoms of acute epidemic meningitis developed, but without fever. The pulse jumped from 88 to 120 and lumbar puncture showed a pressure of 280 mm. water, with meningococci. The third hour there was slight fever and it ran up high the next morning, when the woman died, scarcely three days after the premonitory symptoms. It was learned later that she had suffered from headaches for some time and had taken medicines for them, which explained the urine reactions. Necropsy disclosed extensive purulent leptomeningitis.

59. **Estimation of Functional Capacity of the Kidneys.**—Von Noorden reviews his extensive experiences with the various technics that have been introduced for this purpose. Five have stood the test of time, he says, and the findings with these are about all we can count on for insight into the condition at the moment, the indications for treatment, and estimation of the outlook. These five are the tests with an excess of salt, of urea, of water, the potassium iodid test, and the determination of the residual nitrogen in the blood. He gives 0.2 gm. potassium iodid in a delicate gelatin capsule on an empty stomach, swallowed with 50 c.c. water. The urine is then drawn with a catheter every five minutes and the saliva is examined every three or five minutes, the latter merely to ascertain when the capsule has been dissolved. In normal conditions the iodin reaction occurs in the saliva after an interval of from eight to twelve minutes, in the urine from three to five minutes later. With gastric dyspepsia the reaction in both may be delayed for five or ten minutes. When the reaction is much slower in appearing in the urine than in the saliva, the kidneys are at fault. A delay of from twenty to thirty-five minutes is moderate; from this to sixty minutes or above is extreme. All the iodin should be eliminated in from twenty-four to thirty hours. He has encountered extreme cases in which iodin was still to be found in the urine after five days. The salt and urea tests are made with 10 gm. salt or 15 gm. urea given with a test diet of milk, rice and dried fruit with 3 gm. salt. His experience has confirmed that the kidneys vary in eliminating salt and urea; sometimes one and sometimes the other is retained, in the mixed forms of kidney disease. But in the majority of cases it is exclusively one or the other. He warns in conclusion that a single determination of the residual nitrogen in the blood is not conclusive, but a progressive rise in the residual nitrogen is a grave sign. Venesection gives no permanent relief. All these tests require scrupulous care and a standard diet; otherwise the findings may be misleading. The aim with all is to ascertain the limits of tolerance, as in diabetes and gout.

62. **Vaccine Therapy of Typhoid.**—Mayer departed from the usual routine treatment of typhoid and applied active immunization in treatment when he had a group of sixteen cases all in men who had been vaccinated against typhoid from one to four months before. His impression is that the disease was rendered milder thereby. The excreta were found free from typhoid bacilli two weeks afterward.

Münchener medizinische Wochenschrift, Munich

January 4, LXIII, No. 1, pp. 1-36

64 *Cesarean Section. (Zur Kaiserschnittfrage.) M. Hofmeier.
65 Clinical Study and Bacteriology of Paratyphoid A Bacillus. A. Schmitz and L. Kirschner.
66 Experiences with and Present Status of the Ninhydrin Reaction. (Zur Technik und klinischen Verwertbarkeit der Abderhaldenschen Reaktion.) E. Bunzel and F. Bloch.
67 *Atropin for Convulsions in Children. (Atropin bei Eklampsia infantum.) F. Rascher.
68 Color Sense of Bees. (Zum Farbensinn der Bienen.) F. Schanz.
69 Transfusion of Blood for the Wounded. (Ueber die Anwendung der Blutübertragung in der Kriegschirurgie.) L. Eloesser.
70 Treatment of Prolapse of Brain Substance. (Behandlung von Gehirnprolapsen im Felde.) E. K. Frey.
71 Combination of Kocher and Bassini Technics for Herniotomy. (Kombinierte Methode der Radikaloperation der Leistenhernie.) E. Grunert.
72 To Close Fistulas after Wounds of the Intestines. (Der Verschluss von Eingeweidefisteln nach Schussverletzungen.) R. Dobbertin.
73 Iodoform or Petroleum Protects Dressing Material against Lice. (Zur Verhütung der Verlausung von Verbänden.) v. Stubenrauch and Zucker.
74 Surgical After-Treatment of the Wounded. (Die chirurgische Nachbehandlung der Kriegsverletzten.) M. Strauss.
75 Emergency Artificial Legs. (Schwierige Immediatprothesen.) F. Seidler.

64. **Cesarean Section.**—Hofmeier has compiled 194 cases of transperitoneal cesarean section with 3 deaths. The list includes 45 from his own service, with one fatality, 19 from Baisch's with no mortality. The other 2 deaths were in Franz's 130 cases. Adding to these Küstner's 110 extraperitoneal cesarean sections with no mortality, we have a total of 304 cases of cesarean sections by other than the classic

technic with only 3 deaths—a record which speaks for itself, especially when it is realized that fully 50 per cent. were not what is called clean cases. Hofmeier now confidently advocates cesarean section by this technic at term when conditions call for inducing premature delivery.

67. **Atropin for Convulsions in Children.**—Rascher relates that a child of 3 had been taken suddenly with severe convulsions and laryngospasm. The pulse was 140, temperature 40 C., with pronounced cyanosis. He had no methylatropinum bromatum, which he would have preferred as less toxic, and had to use atropin sulphate, which he injected, dissolved in boiled water. The dose was 0.0001 gm. of the atropin. The laryngospasm subsided in half a minute and the clonic spasms a few minutes later. There were still a few slight spasms in the arms up to the end of the half hour but then the child was sleeping quietly and had no further convulsions, while the temperature was permanently normal. No cause for the convulsions could be discovered unless possibly the too monotonous diet of boiled milk.

Wiener klinische Wochenschrift, Vienna

Dec. 30, 1915, XXVIII, No. 52, pp. 1433-1460

76 *No Immunizing or Curative Power Found in Cancer Juice. (Kritische Studien zur experimentellen Therapie maligner Neoplasmen. I.) S. Fränkel and E. Fürer.

77 Influence of Febrile Temperature on Course of Syphilis. (Zur Kenntnis der Einwirkung fieberhafter Temperaturen auf den Verlauf der Syphilis.) F. Luithlen.

78 Pseudarthrosis of Metacarpal Bones after Fracture in War. A. Saxl.

79 Bubonic Plague at Shanghai. (Zur Epidemiologie der Pest.) F. Vecsei.

80 Plans for Hospital in Barracks. (Anlage von stabilen Barackenspitälern.) K. Feistmantel.

January 6, XXIX, No. 1, pp. 1-32

81 The War and the Medical Profession. (Der Krieg und die Aerzte.) A. Fraenkel.

82 Treatment of Frostbite. (Zur Behandlung der Erfrierungen im Felde.) O. Zuckerkandl.

83 Tendency of Wounded Limbs to Freeze. (Neigung verletzter Gliedmassen zu Erfrierungen.) S. Plaschkes.

84 Gas Gangrene. (Der Gasbrand.) F. Derganz.

85 *Salvarsan Treatment. (Ueber Salvarsannatrium nebst einigen allgemeinen Bemerkungen zur Salvarsantherapie.) A. Brandweiner.

86 Prothesis for Stump unable to Bear Weight. (Verstellbarer Sitzring für Beinprothesen.) A. Saxl.

87 Duplicate Coupon Tag System to Facilitate Hospital Records. (Neue Methode zur Vereinheitlichung und Beschleunigung des militärärztlichen Dienstes in den Sanitätsanstalten.) S. Jellinek.

76. **Therapeutic Inefficiency of Cancer Juice.**—This communication from the chemical laboratory of the Austrian Cancer Research Society reports absolutely negative results in extensive experimental research with the juice expressed from various types of cancers. The positive statements in this line of various scientists are discussed in turn and answered by the results of personal research. The only positive findings were that tumor cells subjected to a pressure of 450 atmospheres proved to be no longer transplantable.

85. **Salvarsan Preparations.**—Brandweiner's experience indicates that salvarsannatrium is somewhat more toxic than neosalvarsan. In his 14,000 injections of salvarsan or its preparations since the war began he is guided by the reaction to the first injection, regarding the slightest trace of headache as a reaction worthy of attention to individualize treatment. He never discharges a patient with "neurorecurrence" until the cerebrospinal fluid gives normal findings. A tendency to sleeplessness and extreme sensitiveness to noises are among the by-effects of salvarsan which he regards as significant. These two symptoms often appear after the first injection and may persist for several days. He knows of a case of very severe intoxication from salvarsan which was accompanied by persisting sleeplessness. Headache, sleeplessness and sensitiveness to noises are the mildest degree of the changes which in severe cases are manifested by hemorrhagic encephalitis. Other symptoms, such as fever, palpitations, etc., he regards as of far less moment, but a toxic eruption after salvarsan calls for great caution. If any of the solution gets outside of the vein, the resulting pain can be relieved by a tourniquet, applying it for ten or twenty minutes at intervals of one or several hours as may be indicated.

Policlinico, Rome

January 2, XXIII, No. 1, pp. 1-36

88 Enrichment Technic for Detection of Scanty Cholera Germs. (Rilievi di tecnica sulla diagnosi batteriologica del colera nell'attuale profilassi.) A. Baldoni.

89 *Prophylaxis of Frostbite. (Intorno al trattamento delle perfrigerazioni di natura circolatoria.) G. Galli.

January 9, No. 2, pp. 37-68

90 Roentgen Localization of Projectiles in the Tissues. (Sopra alcune modalita tecniche per rendere piu agevole, rapida ed esatta la ricerca dei proiettili nei tessuti per mezzo della radioscopia.) F. Ghilarducci.

91 Prophylaxis and Treatment of Frostbite. (Sui congelamenti degli arti.) L. Cherubini; (Sulla profilassi delle congelazioni.) T. Pontano.

January, Medical Section, No. 1, pp. 1-32

92 Tests for Occult Gastro-Intestinal Hemorrhage. (Sulle emorragie occulte del canale digerente.) B. Maiolo.

93 *Hemolytic Jaundice; Recovery under Roentgen Exposures of Spleen. (Ittero- emolitico splenomegalico primitivo guarito coi raggi. X.) G. Jona.

January, Surgical Section, No. 1, pp. 1-32

94 *Sporotrichosis of the Bones. (Sporotricosi ossea.) G. D'Agata.

95 Fascia Flap in Treatment of Hernia; Two Cases. (I trapianti liberi di aponevrosi nella cura dell'ernia.) A. Amatore.

96 Gunshot and Shell Wounds of the Abdomen. (Considerazioni sulle ferite d'arma da fuoco dell'addome.) O. Cignozzi. To be continued.

89. **Prophylaxis of Frostbite.**—Galli expatiates on the importance of keeping the circulation active in the feet to ward off frostbite, and emphasizes the importance of predisposing factors such as a sluggish circulation in general. He warns that men of this type should not be sent to the especially exposed posts. The right man in the right place is one of the great secrets of military success. Fatigue also is an important factor in rendering the circulation sluggish, and he urges frequent changing about and relieving of the men. Those particularly exposed to frostbite should be given amply large boots with nothing to lace. The walls of the vessels in the legs may be toned up by daily rubbing with snow; the vasomotor nerves thus learn to function better. Hot coffee is a powerful tonic for the circulation, and is extremely useful for the men at particularly exposed points. Where this is not available, some drug might be taken for a heart tonic, such as a pill of caffein with extract of strophanthus.

93. **Hemolytic Jaundice with Recovery under Roentgenotherapy.**—Jona's patient was a young man of 18, previously healthy, although living in a malarial region. In 1911 he began to feel weak and languid, with jaundice and with dyspnea on the slightest exertion and the spleen became enormously enlarged. The diagnosis of acquired primary hemolytic jaundice was beyond question, and while splenectomy was being considered, roentgenotherapy was tentatively applied to the spleen. Improvement was soon apparent both in the general condition and the blood picture. After twenty-one exposures in forty-three days the young man considered himself cured, and there has been no sign of recurrence during the three years since to date. In two months the reds had increased from 2,496,000 to 3,650,000, the hemoglobin from 54 to 70 per cent. The spleen measured at first 34x19 cm.; at the close of the course, 27x15 and on recent reexamination 15x9. Jona exposed the spleen from the front one day, from the left side the next day, and from the rear the third day, recommencing the series after a five days' rest. The exposures were each for ten minutes, with a current of 110 volts and 20 amperes. The tube was placed at a distance of 40 cm. and a 1 mm. aluminum filter was used, with a medium hard tube. Jona cites the two cases of congenital hemolytic jaundice reported by Parisot in 1913 in which marked improvement followed exposure of the spleen to the Roentgen rays. He knows of no previous instance of benefit from roentgenotherapy in the acquired form, but insists that roentgenotherapy should be given a thorough trial, before splenectomy, in all such cases.

94. **Sporotrichosis of Long Bones.**—D'Agata remarks that when a subacute or chronic osteomyelitis or osteoperiostitis develops from sporotrichosis, the differential diagnosis is often difficult if there are no skin lesions to suggest the clue. With laboratory methods differentiation is a simple and easy

matter. In his case the lesion in question was in the upper jaw, and deceptively simulated a tuberculous or syphilitic process.

Brazil-Medico, Rio de Janeiro

Dec. 18, 1915, XXIX, No. 48, pp. 377-384

97 Brazilian Worm-Like Internal Parasites: Entozoa. (Revisão dos Acantocephalos brazileiros. II. Familia echinorhynchidae Hamann, 1892.) L. Travassos.

Dec. 25, No. 49, pp. 385-392

98 Brazilian Endoparasitic Nematoid Worms. (Trichostrongylideos brazileiras. IV.) L. Travassos; (Acheilostoma paranecator, n. sp. Novo nematoide parasito do equus asinus.) L. Travassos and F. P. Horta.

January 1, XXX, No. 1, pp. 1-8

99 Helminths of Lower Rio de Janeiro District. (Informações sobre a fauna helminthologica sul-fluminense.) L. Travassos.

100 Banti's Disease Simulated by Syphilis. (Syndroma syphilitica de Banti.) O. Clark. To be continued.

Semana Medica, Buenos Aires

Sept. 2, 1915, XXII, No. 35, pp. 267-298

101 *Treatment of Eclampsia. N. P. Costa.

102 Julio Mendez' Biological Theory of Immunity, and Vaccine Therapy Based thereon. P. Ivanissevich.

Nov. 11, 1915, No. 45, pp. 575-602

103 Present Status of Exophthalmic Goiter. (Enfermedad de Basedow.) C. P. Mayer.

104 *Serotherapy of Bubonic Plague. J. Moreno. Commenced in No. 30.

Nov. 18, No. 46, pp. 603-630

105 Serotherapy of Pneumonia. (La bronco-pneumonia y el suero del Dr. Julio Lemos.) D. Paternoster.

106 *Importance of Gynecologic Examination in Acute Mania, Hysteria, etc. (Del psiquiatra al ginecoiatra.) A. D'Alessandro. Commenced in No. 43.

Nov. 25, No. 47, pp. 631-658

107 Experiences with Induced Pneumothorax in Treatment of Pulmonary Tuberculosis. D. Paternoster.

101. Reviewed recently in these columns, p. 156.

104. **Serotherapy of Bubonic Plague.**—Some of the seven previous instalments of Moreno's long review of his clinical experience with bubonic plague have already been reviewed in these columns. He is physician in chief of the isolation hospital at Buenos Aires, and his conclusions are drawn from extensive experience. He asserts that a dose of 20 c.c. of antiplague vaccine for adults and 10 c.c. for children over 5 confers immunity, but only for about ten days. In treatment antiplague serum must be given in doses of 100 c.c. and the intravenous is the only reliable route; the injections should be repeated as indicated. Later reinjection of serum may induce general symptoms, but they are not as severe as those observed in laboratory animals under the same conditions, and they are never serious enough to justify withholding serotherapy in a case of bubonic plague. The disease is liable to be grave in any form in which it may appear, and consequently it always calls for serotherapy. Symptomatic measures should be applied as indicated to supplement the serotherapy. In conclusion he reiterates that injection of antiplague serum is the best treatment of plague, and that the numerous case reports published apparently demonstrate the superiority of the Argentine intensive intravenous method, as applied by Penna and himself. The peculiar gravity of pneumonic plague is due to the rapidity with which degenerative changes become installed, before serotherapy is applied. Local necrotic patches seem to be benefited by local application of the antiplague serum.

106. **Gynecology and Psychiatry.**—D'Alessandro relates a number of instances in which disease of the genital organs entailed nervous, hysteric and psychic symptoms which led to the internment of the woman before the genital cause was suspected. After removal of the cause, normal conditions were soon restored. The predominance of the psychic symptoms causes the attending physician to overlook the dysmenorrhea or abrupt amenorrhea, loss of appetite, etc. After excluding pregnancy, he sends the woman to the detention hospital without a minute gynecologic examination. Depression and psychic symptoms in one girl of 18, D'Alessandro ascribed to the dysmenorrhea from congenital stenosis. On this assumption he applied symptomatic treatment, without direct examination, ordering hot foot baths and sitz baths, with senna and sodium sulphate by the mouth and in enemas, with sedatives as needed. The complete restoration of normal physical and mental conditions confirmed the correctness of his diagnosis. In another case, a girl of 14 menstruated once, with considerable pain, and then fell into a somnolent state for four months. When she roused from this her mind seemed affected. Symptomatic treatment to bring the menstruation into a normal course soon cured her completely. Another girl of 19 showed signs of insanity after two months of marriage. As the condition grew worse she was on the point of being sent to the asylum when, as a last resort, the long and narrow cervix was dilated with an instrument and hot intra-uterine douches given. The amenorrhea and dysmenorrhea were thus combated and normal conditions were soon restored. In all these cases the women bore healthy children later and have had no further known psychic disturbances.

Six other cases similar to these are reported and five others in which there was an inflammatory process in the uterus or cervix, genital prolapse or a rectovaginal fistula. The recovery from the mania was particularly prompt in this last group. An intra-uterine polyp in another case was evidently the cause of repeated abortions. Each was accompanied by acute mania. After removal of the polyp normal pregnancies followed, with no return of the mania. Another of his patients was the mother of three healthy children when she became apparently insane and, on the advice of three alienists, was placed in an asylum for a month and improved somewhat. A tendency to hemorrhagic endometritis was then casually discovered. It was evidently of long standing, and as it healed under appropriate measures she regained her mental poise. In three other cases there was erotic mania. The women were 28, 31 and 35, and one had an inflamed Bartholin's gland, as large as a hen's egg, one a polyp in the uterus, and one disease of the clitoris. All recovered under local measures and had no remembrance of what had occurred during their insane periods. These twenty cases are only a few out of D'Alessandro's wide experience, he states. He cites in conclusion the case of a wealthy man of high character who is now a widower for the third time. During his phases of married life he became insane, but normal mental conditions were restored each time after the loss of his wife.

Nederlandsch Tijdschrift voor Geneeskunde, Amsterdam

January 1, LX, I, No. 1, pp. 1-116

108 *Results of Salvarsan Treatment of Tabes and Progressive Paralysis. (Eenige uitkomsten der salvarsanbehandeling bij tabes en dementia-paralytica.) F. S. Meijers.

109 Influence of the Position of the Head on the Tonus of the Muscles in the Limbs. (Over den invloed van den stand van het hoofd op den tonus van de spieren der ledematen.) W. S. van Leeuwen.

110 Osgood-Schlatter Fracture of the Tibia. (Een geval van beenbreuk van Osgood-Schlatter.) S. Diamant.

January 8, No. 2, pp. 117-192

111 Death as a Physiologic Phenomenon. (De dood als physiologisch verschijnsel.) E. Verschaffelt.

112 *Life Insurance in the Tropics. (Levensverzekering en Indisch risico.) R. Römer.

113 *Whooping-Cough. (Waarnemingen bij kinkhoest.) N. Benstz.

108. **Salvarsan in Tabes and General Paresis.**—Meijers reports his experience in this line with ten patients with paretic dementia, beginning with 0.15 gm. neosalvarsan and increasing to 0.45 or 0.6 gm. to a total of from 4 to 4.2 gm. This was supplemented by mercurial treatment and potassium iodid, the course extending over two months. A slight increase in weight was apparent in a few, but aside from this there was no improvement in any way, and the course of the cases later did not differ in any respect from that of the patients not given this treatment. He reports further another case in a man of 38 in which the general paresis was suspected in its very incipiency by positive serologic findings in the cerebrospinal fluid when the man was being treated for an industrial accident and the fluid happened to be casually examined. He was given thorough treatment as above, but the paresis proceeded in its inexorable development later, unmodified in any way by the vigorous measures that had been applied, hoping to abort it. This disappointing outcome in progressive paralysis would put an end to attempts at

specific treatment if it were not for the fact that direct syphilitic involvement of the nervous system may manifest itself by symptoms and serologic findings resembling those of progressive paralysis while—unlike the latter—they may prove amenable to specific treatment. It is justified therefore in every case of this kind.

His results in eight cases of tabes were far more encouraging. All but one displayed marked benefit from the treatment. It seemed to be as effectual when the neosalvarsan was injected intravenously as by the more complicated Swift and Ellis technic, which he applied in five of the eight cases. No untoward by-effects were observed in any of the total eighteen cases, and no change occurred in the cell content of the fluid nor in the Nonne albumin reaction. In the tabes cases, the pupil and Achilles tendon reflexes did not seem to be modified, but the distressing headaches and visceral crises were much benefited, as also the annoying incontinence of urine. The ataxia persisted unmodified, except in one case in which there was improvement such that the patient could get around the house.

112. **Life Insurance in the Tropics.**—Römer comments on the way in which life insurance in the tropics is profiting by the progress of recent years in tropical medicine. He refers particularly to the Dutch East Indies where hygiene is reducing the policy rates for candidates. He cites a life expectancy table compiled by Ulpianus for the Roman army in the second century after Christ, and compares it with a table compiled for the Netherlands by van Pesch for the years 1890-1899. The life expectancy for the age 20 to 25 in the Roman table was 30 years; in the Netherlands table, 41.2. From 40 to 50, in the Roman, from 19 to 10 years, and in the Netherlands 25.9 years. Römer has found that the life expectancy for officials in the Dutch East Indies is 5 years less, up to 35; 4 years less at 40; 2 years less at 50, while at 70 it averages the same as in the Netherlands. No statistics are available for non-officials, he says, there being nothing comparable to the mortality records published by the Mutual Company of New York. Römer reiterates that the direct influence of the tropical climate has been much exaggerated. Eykman's researches have established that the metabolic processes show no appreciable difference in the healthy in the tropics from those of cooler climes. The intestine may be in a condition of lessened resistance, but this is the result of errors in diet, especially overloading with rice. The mortality among Europeans seems to be highest the third year of their residence in the tropics, then the fourth and fifth. On return to a temperate climate they are liable to pneumonia, and amebic dysentery may be responsible years later for an abscess in the brain or liver. Chronic malaria, sprue, heart disease and, especially, gout may reduce the life expectancy after return to Europe. An assumed simple cardialgia or gastritis may be the first manifestation of an ulcer or cancer. He urges that careful records be kept of persons who have returned from a residence in the tropics.

Abuse of alcohol or tobacco is an important factor in the life expectancy in the tropics, and if the candidate is a total abstainer, the cause for this should be investigated. The danger of syphilis is greater in the tropics, and tuberculosis runs a particularly malignant course there. To this contributes the fact that the heart beat is accelerated on an average ten beats a minute and the respiration often by 4.5. Especially in the tropics, married men are better risks than the unmarried, as there is greater care for hygiene. Lands newly opened to colonization reduce the life expectancy somewhat. A tendency to corpulence is particularly isky in the tropics on account of the disinclination to exercise and the tendency to overeat.

113. **The Blood in Whooping Cough.**—Benstz tabulates the findings in sixty-three cases of whooping cough, classifying them in infants under 1 year and children up to 6 years of age. There was always leukocytosis, most pronounced when there were bronchitic complications. The number of eosinophils was below normal in every case, while the mononuclears and transitional forms were much increased, reaching 18 per cent. at the height of the disease. A detailed report is also given of systematic treatment with various drugs. No effect was evident with most of them, but some favorable action was manifested by extract of belladonna, from 1 to 6 mg. three times a day.

Hospitalstidende, Copenhagen

January 12, LIX, No. 2, pp. 25-44

114 Amyotonia Congenita. (Myatonia congenita—Oppenheims Sygdom—og congenit familiær progressiv Muskelatrofi.) K. H. Krabbe. Commenced in No. 1.

115 Modified Technic for Recording the Pulse. (Et praktisk Vink ved Registrering av Pulsen.) C. Lundsgaard.

Hygiea, Stockholm

LXXVII, No. 24, pp. 1489-1558

116 Induced Pneumothorax in Treatment of Pulmonary Tuberculosis; Sixty Cases. (Behandlingen av lungsot med konstgjord pneumothorax.) H. Wetterdal.

117 Centric Photographing of the Fundus of the Eye. (Om centrisk fotografering av ögonbottnen.) J. W. Nordenson.

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118 Simultaneous Occurrence of Several Independent Tumors. (Om samtidig forekomst av flere selvstændig voksende—multiple—svulster.) F. Harbitz. To be continued.

119 *Management of the Prematurely Born. (Om behandlingen av for tidlig fødte barn.) T. Frølich.

120 *Examination of Air and Dust for Tubercle Bacilli in Sanatorium. (Undersøkelser angaaende tilstedeværelse av virulente tuberkelbaciller i luft og støv paa Reknes sanatoriums værelser.) E. Kaurin.

121 *Dietetic Treatment of Beriberi in Dutch East Indies. (Indberetning om forsøk paa beri-beripatienter med tørrede erter og havregryn.) D. J. H. Pol.

119. **The Prematurely Born.**—Frølich tabulates the temperature, weight and other details of three prematurely born infants in his private practice. Notwithstanding all the efforts to warm up the children their temperatures kept abnormally low, going sometimes below 36 C. (96.8 F.). He emphasizes the necessity for guarding against overfeeding, especially with milk containing much fat. From 110 to 120 calories per kilogram is his rule, giving them in the form of skimmed milk with addition of flour and sugar, as Birk recommends, if breast milk is not available. The general'y accepted opinion that 140 calories per kg. are needed he thinks is a mistake. The prematurely born are peculiarly predisposed to infections and especially to complications on the part of the respiratory tract, and hence absolute isolation from other children is indispensable in the home.

120. **Tubercle Bacilli in Air and Dust.**—Kaurin inoculated animals with culture mediums long left exposed to the air in rooms occupied by the tuberculous. Also with dust from the toilet rooms, hall and other parts of the sanatorium where the inmates congregated. No acid-fast bacilli could be detected in any of the seven groups of tests, and none of the fourteen animals showed any sign of infection. These findings harmonize with the experiences of the seventeen years during which none of the attendants or other persons connected with the sanatorium has contracted tuberculosis.

121. **Dietetic Treatment of Beriberi.**—Pol found that large amounts of a purée of peas had an unmistakably curative action on beriberi. As much as 150 gm. of the purée three times a day was required for this, smaller amounts showing no benefit. Oatmeal had a similar influence, but 125 gm. three times a day were necessary. Europeans did not require quite so much. The minute details of eighty-six cases are tabulated, filling thirty-three pages. A native bean seems to have also an effectual action. These three vegetables evidently contain the substance or substances the lack of which induces beriberi. Attention is called to the fact that these vegetables lose their efficiency in this line with age. Three-year old beans seemed to be quite inert.

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122 *Epidemic of Scarlet Fever. (Scarlatina-Epidemien i Lyngby og Omegn 1912-1913.) J. Lemche.

122. **Scarlet Fever Epidemic.**—This is an epidemiologic study of 473 cases of scarlet fever in four months in 1913 in a Danish town. The mortality was 4.86 per cent.